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AMERICAN NURSERYMAN

The Nurseryman's Forte: To Make America More Beautiful and Fruitful

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Acer Palmatum Multifidum

Trade Faces Threat of Foreign Imports
Effects of Wages and Hours Bill
Test Chemicals in Rooting Cuttings
Three Rusts on Cedars

AMERICAN NURSERYMAN

Chief Exponent of the Nursery Trade

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WAGES AND HOURS BILL.

Early on the calendar of the special session of Congress is legislation restricting the wages and hours of industrial labor. That is included in the purposes for which the President called the special session. Recent events make it likely that one of the milder forms of such legislation will be adopted. With Congressman Connery dead and Senator Black sitting in the Supreme court, the original Black-Connery bill is generally considered dead, although some of its provisions may be included in the law to be passed. If the administration does not insist upon wide discretionary powers for the fair labor standards board to be created, early passage is considered likely for some form of wages and hours legislation, probably in the form of the bill that passed the Senate at the last session, but failed to reach the floor of the House of Representatives.

Such a law would primarily affect industrial labor. The exemption recently secured for field labor in the nursery under the social security act, and the definition of persons engaged in horticultural pursuits as agricultural labor under the wages and hours bill of last session do not, however, remove nurserymen, their employees and their customers from feeling the effects of such a bill. Agricultural labor has a stake in the wages and hours controversy, and on that account a statement presenting the farmers' viewpoint is presented in brief form on another page. Every nurseryman knows what higher prices do to his volume of sales, and with this in mind he may wish to inform his representatives at Washington how he stands with regard to wages and hours legislation.

RULING TO BE CLARIFIED.

Social security ruling inquiries of subscribers indicate already that the ruling by the internal revenue bureau, published in the November 1 issue of this magazine, extending to nursery employees the exemption accorded to agricultural labor under the law, is creating problems of various kinds.

Chief of them, of course, is the distinction between the employees "on a farm" and the rest of the staff. How far the exemption applies apparently is not clear.

Some of the problems in the differentiation of nursery employees in the application of the act were pointed out in the October 15 issue. In this broad division the commissioner of internal revenue has sought to meet the issue already, but probably a number of individual cases will have to be considered and decisions made before the outcome is definitely known.

Anyone familiar with income tax problems or, indeed, any other federal tax, is aware of the great number of opinions, rulings, Treasury decisions, court decisions, etc., that form a part of the provisions for application of the statutes. Reference to any tax service reveals at a glance the appalling number of rulings on various details. And they are still coming, as one may see by the weekly issues of the Internal Revenue Bulletin, a pamphlet of thirty or forty pages, containing the various rulings and decisions on income, estate, gift, sales, capital stock, social security and miscellaneous taxes. Those on the social security tax have just begun, and many points are yet to be settled.

When the American Association of Nurserymen sent out the complete text of the ruling to each member, it was hoped that a legal interpretation might be sent along also, to make for uniformity and further reports to the internal revenue bureau and in claims for refunds. This was found not possible, however, and it will be necessary for each nursery to use its own interpretation of the ruling and settle its individual problems in the light of government decisions.

ACER PALMATUM MULTIFIDUM.

The cut-leaved Japanese maple shown on the front cover has long been known as Acer palmatum dissectum, and this botanical name will likely persist for some time, but the latest authorities—Bailey in "Hortus" and Rehder in "Manual of Cultivated Trees and Shrubs"—recognize Acer palmatum multifidum as the preferred name, with ornatum instead of atropurpureum being used to designate the red-leaved form.

This maple, which is more truly a shrub than a tree, is too well known, at least in the eastern section of this country, to warrant describing it in detail, but for the benefit of those who may be unfamiliar with it—and there may be a number, judging from the scarcity with which it is planted throughout the middle west—a few notes will be recorded.

Six feet is a good average height; in the north it may not do that well, whereas under especially favorable conditions it will grow taller. It is a graceful spreading shrub, frequently assuming the mound-like form shown in the illustration. It is a refined plant, because of its grace in growth and its delicate, feathery, light green foliage. In autumn the leaves take on lovely orange tones.

As a lawn specimen or for using in a foundation planting or shrub border, the cut-leaved Japanese maple is equally well suited, and it is an excellent background subject for a rock garden. In this connection, it should be mentioned that the red-leaved form, which is much dwarfer, is well suited for planting within a rockery.

Grafting is the propagation method employed to reproduce the varietal forms, such as multifidum, seedlings of palmatum being used as the understock. Whip or veneer grafts are generally employed. This work is usually done under glass in late winter and early spring, an inclosed case being necessary, though grafts can be

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AMERICAN NURSERYMAN

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Trade Faces Threat of Foreign Imports

Present Policy of Federal Plant Quarantine Bureau May Open Door to Unrestricted Shipments of Nursery Stock from Abroad

Recent developments bring the trade face to face with a threat greater in its possibilities for injury to the nursery business than social security taxes, labor troubles or other major adversities. If the current policy of the bureau of entomology and plant quarantine of the United States Department of Agriculture is carried out according to the present tendency, imports of foreign nursery stock may flood our markets as in the days before the plant quarantine act and the imposition of quarantine 37. The danger is more acute now that higher wages, shorter hours, taxes and rising costs of materials necessitate higher prices for nursery stock grown in this country.

In a statement issued October 18 to recipients of special permits for importation of propagating material under regulation 14 of quarantine 37 was seen the apparent possibility of foreign imports of plants, cuttings, roots and bulbs in almost unlimited quantities. Since 1931 fixed limits have been set on the quantity which any individual might be given permit to import, the number depending upon the need for the individual items and their production in this country, taking into account the pest risk involved. These quantity limits were set forth in circular PQCA-278, effective July 17, 1931. The restrictions imposed, according to the bureau of plant quarantine, have been defeated through use of the so-called contractual arrangement. The bureau asserts that this is a situation with which the Department of Agriculture cannot cope, since there is no way of determining whether the contractual arrangement is serving as a subterfuge. Hence, according to the statement of October 18, there is being considered the cancellation of PQCA-278, so that prospective permittees may in future apply for a permit to import any number of plants they desire, "with the understanding that, if the quantity stated in the application exceeds that which can be promptly inspected and adequately safeguarded, the applicants will be so informed." If the proposed change is made, imports of nearly 200 different genera of plants listed in circular PQCA-278 will be limited only by the ability of the inspectors to pass on the material when it reaches the ports of this country.

The matter assumes a broader aspect when it is known that in Chicago last week at the annual meeting of the National Plant Board the subject of importation of nursery stock under quarantine 37 was discussed with Dr. Lee A. Strong present. A report of this meeting appears on the next page. There are four sectional plant boards—eastern, southern, western and north central—composed of those in charge of quarantine enforcement in the various states. Two members of each sectional board meet together as the National Plant Board. In the past, a contemplated move in Washington has been discussed at meetings of the various plant boards. In consequence, the opinion of state entomologists and plant inspectors of the country was ascertained and already crystallized by the time a hearing was held at Washington.

The handwriting on the wall has been plain for some months. Last July, at the convention of the American Association of Nurserymen at Chicago, Dr. Lee A. Strong, chief of the bureau of entomology and plant quarantine, delivered an address, printed in full in the August 1 issue of this magazine under the heading, "Quarantine on Pests, Not Plants." In his address, Dr. Strong made it plain that he believed the plant quarantine act should be enforced solely for the purpose of excluding from this country plant pests and diseases, and not for the purpose of eliminating foreign competition in plant products. Toward the end of his address, Dr. Strong made the following statement:

"Many American growers have built their businesses on the trade protection afforded by the policies followed in administering quarantine 37. In justice to them, the department has issued repeated statements pointing out that the plant quarantine act and quarantines promulgated thereunder should be administered for the sole purpose of preventing the entry into this country and the spread within the United States of injurious plant pests. These statements have been a warning to growers to adjust their businesses away from the false basis of the trade protection given them by the administrative procedure we have been discussing."

The warning he delivered at that time apparently has not been heeded by any branch of commercial horticultural interests, for the reason that the restrictions lifted up to this time have been comparatively unimportant commercially. But if the policy is

carried to its logical conclusion, the wholesale restrictions on entire classes of plants and bulbs will be a thing of the past. Dr. Strong made it plain in his address that he preferred more inspection at the ports of entry and less exclusion of plant groups as a whole.

In his interpretation of the plant pest act, Dr. Strong is more logical and more legally accurate than his predecessor, Dr. Marlatt, whose stated object was to make American horticulture self-supporting and to embargo foreign plant products. His interpretation of the law was criticized by trade and public alike at the time, but no court test was ever made. The reversal of interpretation under Dr. Strong is apparent from the following paragraphs he wrote this month in regard to the statement of October 18 mentioned above, replying to a protest for gladiolus growers in this country:

"The plant quarantine act was passed and quarantines promulgated thereunder have been put into effect for the purpose of keeping plant pests out of the country. It was not the intention, I am sure, of Congress to use a law passed for the purpose of keeping pests out of the country to prevent competition in the trade field. If trade protection is sought, this should be brought about under legislation which has no connection at all with the enforcement of plant quarantines for the prevention of entry of pests.

"It is believed that plants which represent a danger to the country through the possible introduction of pests should be entirely excluded and those which represent no pest risk should be admitted in unlimited quantities under inspection so far as any plant quarantine regulations may be concerned.

"With respect to gladiolus bulbs, certainly if they are infested with pests which represent a pest risk to the agriculture and horticulture of this country, full consideration should be given to keeping them out entirely. But if it is merely a matter of protecting the growers of gladiolus bulbs in this country from competition, then that should be taken care of under some other instrument than the plant quarantine act."

In the eighteen years since quarantine 37 was promulgated, nurserymen have learned to propagate successfully in this country many items that formerly were imported in large quantities. The present California and Texas rose production was undreamed of, for this country bought its plants from Europe. Only a few varieties of our evergreens were propagated here; the great majority came from abroad. Nurserymen were even more dependent upon imports than florists, who bought their palms, boxwoods, bay trees and many other plants and nearly all their bulbs from foreign sources. But a handful of such merchandise was produced in this country twenty years ago. Now, through force of necessity imposed by quarantine 37, virtually all of such stock is propagated and grown in this country.

Anyone who reads foreign catalogues or trade papers realizes that the horticultural products of other countries are excluded from American competition not by price or tariff, but by quarantine 37. It is the barrier that stands between American nurserymen and low-priced foreign merchandise, of which there are many examples in other lines of American industry.

As stated before, wages in this country are higher per hour than ever before, working hours are shorter and may be reduced farther by federal legislation, living standards and material costs are much higher in America than anywhere abroad, and in international commerce other currencies are cheap in comparison with the dollar. Hence the possibility of horticultural merchandise from foreign sources undermining American commercial horticulture on a price basis is definitely greater today than ever before.

Trade treaties negotiated by the Department of State at Washington have opened our doors to foreign competition in other lines. Agriculture in this country has felt the competition of foreign grain and foodstuffs, because of low tariffs on the one hand and high prices produced by short supplies in this country on the other. American agriculture is clamoring for tariff protection and is opposing those governmental measures which will create higher prices in this country, inviting further foreign competition.

If the bars put up eighteen years ago under quarantine 37 are now let down, whether one by one or altogether, growers of nursery stock in this country will require protection for their business "by some other instrument," as Dr. Strong puts it. If a tariff measure is required, nurserymen must get their congressmen busy at once. If the suitable procedure is amendment of the plant quarantine act, so that it will legally embody the policies hitherto followed in its interpretation at Washington, congressional action is likewise necessary. The trade has confronting it a danger more serious than heavy taxation or labor restrictions, a threat to the very existence of producers.

There is the further prospect that some individual states will seek to protect themselves with local quarantines as the restrictions of the federal quarantine are lifted, thus adding to the difficulties of interstate shipment which nurserymen feel already.

DISCUSS QUARANTINE 37.

At Plant Board Meeting.

Possibility of the removal of restrictions on importations of nursery stock and other plant materials from foreign countries by changing the regulations of quarantine 37 was discussed at a special open session at the annual meeting of the National Plant Board at the Congress hotel, Chicago, November 12. Dr. Lee A. Strong, chief of the bureau of entomology and plant quarantine of the United States Department of Agriculture, was present at the session, as were several nurserymen and a number of state officials interested in the subject.

Presumably, a discussion of quarantine 37 was not on the agenda for the plant board meeting, but the subject was brought up because of a notice sent out by Dr. Strong October 18 to special permittees to the effect that the quarantine administration at Washington is considering the revision of regulation 14 of quarantine 37 so that permittees may apply for a permit to import any number of plants they desire. M. S. Yeomans, entomologist of the state of Georgia and chairman of the board, permitted the visitors to express their views on the subject, all of which were in opposition to the removal of present restrictions because of the risk of pests and diseases. G. R. Hyslop, Corvallis, Ore.,

(Continued on page 23.)

Effects of Wages and Hours Bill

Though Exempt from the Proposed Provisions, Agriculture Will Feel the Results in Prices, Costs, Markets and Labor

Farmers of America are face to face with a critical situation because of the wages and hours legislation which the President wants passed at the special session of Congress.

Analysis shows that the proposed legislation will have a fourfold injurious effect on farmers. It will increase the cost of everything the farmer buys; it will decrease the price he receives for his commodities; it will increase the cost of farm labor and even make it too expensive for farmers to hire help at all, and it will offer foreign farmers, with low living standards and production costs, tremendous competitive advantages in domestic markets now open to our farmers.

Although agriculture is the nation's basic industry, the bill makes no provision for a farm member on the five-man board. It does, however, specifically provide for a representative of capital and one of labor among its five members.

The findings of this board, which are conclusive and largely not subject to review by the courts, will artificially raise the cost of practically every article produced in the United States. Intrastate commerce will be affected as well as interstate business. Consumers who need the goods will be forced to pay or do without. Prices of household needs, such as clothing and furniture, as well as farm implements and supplies, such as wire, fertilizer and stock feeds, will all be raised.

And while farmers are forced to pay more for what they buy, they will receive less for what they sell. Dairy farmers, for example, know from many sad experiences that when the cost of marketing and distributing milk is increased, the added expense is seldom extracted from the distributor's profits or the consumer's pocket. Invariably the advance is passed along to the dairy farmer by paying him slightly less for his milk. Wherever agricultural commodities are processed and marketed by other than farmers, that rule generally holds true.

Especially heavy will be the burden placed on agriculture by the provisions in the bill for overtime payment. This is the most serious direct result of the legislation on agriculture. You cannot make or market beefsteaks or butter mechanically, like motor cars or radios. Every live stock farmer knows that the number of animals received at the yards is considerably higher at the beginning of the week than at the end. The dairy farmer knows that during flush periods in spring and fall dairy plants of all types are taxed to capacity. Ordinarily the longer hours necessitated by operation of these natural or economic laws are compensated in the agricultural industries by shorter hours in less busy times. This is not recognized in the wages and hours bill, although it is a fundamental principle in the marketing and processing of agricultural commodities.

As a third result of the bill, farm labor will be hard to obtain. For some time farmers have complained that, due to competition with P. W. A. and W. P. A., they could not hire men at wages they could afford to pay. So it is certain that the lure of at least 40 cents an hour and time and one-half for overtime is going to draw hundreds of thousands of competent farm hands from the farm lands into industrial channels.

Thus, although certain agricultural labor is exempted from provisions of the bill generally, the long-time effect will be to force the farmer to meet the high wage scale for city labor or do his work without help. Undoubtedly few farmers would feel able to pay the hired man 40 cents an hour for a 40-hour week with no allowance permissible for "keep."

Of grave import, also, will be the effect of the new legislation on the nation's foreign trade in agricultural commodities. Already American agriculture has suffered lasting injury from the lowered tariff walls fixed by the fifteen trade agreements entered into with foreign nations under the nation's so-called "good neighbor policy." Under the proposed wages and hours bill a policy will be inaugurated which is absolutely opposed to this trade agreement program. Costs of manufacturing and selling goods of domestic origin will go up, but no proposal has been included of an embargo on imported goods or products manufactured, processed, or marketed by foreign countries where wage and hour requirements are far below those under which the new law will compel American citizens to operate.

It can mean but one thing: Because of the increased advantages given foreign nations, American labor will no longer be able to produce American wares for American markets, and urban relief rolls will grow again. And in rural sections American farmers will see American housewives turning to the farmers of Canada, of Poland and other agricultural nations when they do the Saturday night shopping for meat, butter, cheese, potatoes and a hundred other farm food products.

The proposed wages and hours bill was jammed through the Senate at the last session despite protests that more lengthy consideration should be given a measure which remakes the entire economic life of the nation. In the House, the labor committee reported it favorably, and as the opening date for the special session draws

Although at least field employees in the nursery are exempt from provisions of the social security act under the recent ruling of the internal revenue bureau, and although the wages and hours bill which passed the Senate at the last session of Congress defined producers of horticultural crops as agricultural labor, the effect of wages and hours legislation would nevertheless be felt by nurserymen. These effects are described in the extracts on this page from a statement issued by the national committee on wage-hour legislation, which has set up temporary headquarters at the Ambassador hotel, Washington, D. C., for the purpose of impressing on members of Congress the farmers' viewpoint in this controversy. The chairman of the committee, which is made up of practical farmers, is John A. McSparran, former master of the Pennsylvania State Grange and former secretary of agriculture of Pennsylvania, and the executive secretary is A. Nevin Detrich. The comparable position of nurserymen and farmers in this controversy makes the statement presented herewith of close interest.

near, it is waiting a rule to put it on the calendar for immediate consideration.

To accomplish what the bill wants to accomplish it is unnecessary to centralize in a Washington bureau the absolute control which the measure decrees over labor conditions in the several states. That power already exists in the states, and the right of a state to regulate labor conditions and protect its workers within its own bounds has been upheld by the United States Supreme court no later than in October, 1936.

What is called for now is merely a declaration by the federal Congress that the states should regulate their own labor standards as they please, but that goods produced under substandard labor conditions cannot enter into interstate commerce. In this way states with low labor standards would be prohibited from competition with the enlightened areas in which prevail the standards labor deems desirable.

FIGHT STATE SALES TAX.

The reversal by the internal revenue bureau of its ruling on nursery labor under the social security act is having repercussion on the collection of state sales taxes on nursery products.

Nurserymen of North Carolina are seeking exemption from the state sales tax, which they have been required in recent months to pay even on plants grown by them. W. T. Hanner and J. Van Lindley, representing the nurserymen of the state, recently conferred with Attorney-General A. A. F. Seawell regarding the legal aspects of the levy.

Originally the nurserymen paid sales tax on items they purchased for resale, but paid no tax on items produced by themselves. But when the internal revenue bureau ruled last January that nurseries should be classified as industrial rather than as agricultural in nature, the state taxing authorities took the position that if the business was industrial, there should be no exemption such as is granted to farmers producing the products they sell. Hence the state tax was extended to cover all nursery sales.

Now that the internal revenue bureau has reversed its previous ruling and is classifying nurseries as agricultural, the nurserymen of North Carolina contend that the state should now reverse its tax policy and should exempt them from payment of the sales tax on items they grow.

Similar action may be taken in states where the law is of the same nature as that in North Carolina, The assistant attorney-general of New Mexico recently ruled that sales by nurseries are subject to the state sales tax there.

WATCH FOR LEGISLATION.

Not only has Congress again assembled at Washington, but several state legislatures are now or soon will be in special session. Nurserymen in those states will do well to keep closely informed on bills introduced and be ready to prevent passage of legislation detrimental to their interests.

In the coming session of Congress there may develop a determined effort to get an appropriation through to support the coöperative farm forestry act. The act was passed by the last Congress, but the appropriation was defeated and the operation of the law so prevented.

If it becomes necessary for nurserymen to write their congressmen on the subject at some time soon, Chet G. Marshall, chairman of the A. A. N. legislative committee, provides some facts for them. For instance, it is not generally realized that the plains shelterbelt project is still functioning in essentially the same way, though under a different name —"prairie states forestry project," with relief funds of $700,000 in 1937 —although it was legislated out of existence and an appropriation of $170,000 made to liquidate it almost two years ago.

The report of the chief of the forest service for 1936 states that $1,602,836.04 was expended on the plains shelterbelt project, and 18,155,878 trees were planted, including 629,810 used for replacement of dead trees and the planting of blank rows. The cost per thousand for seedlings planted averaged $88.

Western nurserymen would like contracts to do the work at half that price or less. The Clark-McNary agency was responsible for the planting of 1,600,000 in Nebraska at a cost of $1,600, or $1 per thousand to the federal government and slightly more to the state. These are succeeding quite as well as the forest service plantings.

WOULD STOP STATE SALES.

At the special session of the state legislature, the Texas Association of Nurserymen was successful in having passed a resolution requesting that government agencies do not offer nursery stock for sale.

The resolution, after reciting that sale of nursery stock by state institutions or agencies is an unfair practice toward the nursery trade, that since they are supported by the state they can afford to sell cheaper, etc., concludes with the statement that "the state highway department and other governmental agencies be, and are hereby requested, not to offer for sale and competition to private industries, evergreens of any description, rosebushes and nursery stock."

NEW DIRECTOR AT GENEVA.

Prof. P. J. Parrott will become director of the New York state agricultural experiment station, at Geneva, January 15 upon the retirement of Dr. U. P. Hedrick, present director.

Born at Croydon, England, Professor Parrott moved to a farm in Kansas with his parents when a small boy. He attended Kansas State University and began his professional career as assistant entomologist at the Kansas Agricultural College in 1898. In 1900 he became assistant entomologist at Geneva, but resigned in 1902 to become entomologist at the Ohio experiment station, at Wooster. In 1904 he returned to Geneva to become chief of the division of entomology. Since 1928 he has been vice-director also.

Professor Parrott has served in an advisory capacity on many important federal commissions and has only recently returned from a trip through Africa which took him from the Cape to Cairo and which included observations on the fruit industry of South Africa for the United States Department of Agriculture.

CELEBRATING the beginning of its ninetieth year, the American Pomological Society will hold its annual convention at Springfield, Mo., December 8 to 10, at the Kenwood Arms hotel.

Test Chemicals in Rooting Cuttings

Results of Experiments with Growth-Promoting Substances in Rooting Cuttings of Numerous Woody Ornamental Plants—By L. C. Chadwick

During the past year the department of floriculture at Ohio State University has been experimenting with various organic compounds commonly known as growth-promoting substances as an aid in the rooting of deciduous and evergreen woody ornamental plants. Various investigators have indicated that the use of some or all of these synthetic growth substances would increase the rooting percentage, shorten the time necessary for root production and increase the amount of roots, as well as induce root growth on cuttings of plants normally very difficult to root. The investigations reported herewith have failed to show that all of these contentions are true.

Cuttings of over 100 different woody ornamental plants have been taken in these tests. The number of different treatments tried with each plant made it necessary to keep the unit rather small. In most cases the unit adopted was twenty-five. In many cases duplicate tests have been run. The growth substances used in these investigations included indolebutyric acid, indoleacetic acid, naphthaleneacetic acid, phenylacetic acid and methyl indolepropionate. Indolebutyric acid has given the best results in most cases.

These organic acids and esters were secured in crystalline form. They can be purchased from such companies as Eastman Chemical Co., Rochester, N. Y.; Merck & Co., Rahway, N. J., and Pennsylvania Chemical Co., Orange, N. J. Enough (125 c.c.) ninety-five per cent ethyl alcohol was added to one gram of the crystal to dissolve it. One hundred and twenty-five cubic centimeters (c.c.) of distilled water was added to give a concentration of four milligrams (mg.) of the acid or ester to 1 c.c. of solution. This was used as the stock solution and further dilutions were made as needed. Examples of dilutions follow:

Requirement	Amount of stock solution (4 mg. per 1 c.c.) per 1000 c.c. or approximately 1 quart
1 mg. per 100 c.c. H_2O	2½ c.c.
2 mg. per 100 c.c. "	5 c.c.
3 mg. per 100 c.c. "	7½ c.c.
4 mg. per 100 c.c. "	10 c.c.
5 mg. per 100 c.c. "	12½ c.c.
8 mg. per 100 c.c. "	20 c.c.
10 mg. per 100 c.c. "	25 c.c.

As an alternative, have your local druggist make the solutions for you. Store the stock solution in colored bottles in a cool, dark place. Solutions have been used five to seven times with no harmful effect. Chemical companies recommend using fresh solution each time, but this is not necessary. One gram of indolebutyric acid used at the rate of 5 mg. per 100 c.c. will treat 15,000 to 20,000 cuttings when the solution is used only once. If the solutions are only used every week it is advisable to keep them in closed containers.

The desired solutions were placed in flat pans to a depth of approximately one inch. The cuttings were made as usual and bunched, with the basal ends even and placed in the solution for the desired length of time. The check cuttings were placed in distilled water for the same length of time. Usually the containers were placed in a lean-to greenhouse, in ample light but not direct sunlight. Upon removal of the cuttings from the solution, they were placed directly in the rooting medium in the usual way without being washed with water. The usual care was given them during the rooting period.

Results.

The results as compiled are given in the tables. Table I shows the effect of the growth substances on cuttings of fifty-seven woody ornamental plants that rooted and showed some response to the treatment. The table shows the most effective growth substance, the most effective concentration and the effective range as determined in these tests. The range of concentrations used was ½, 1, 2, 3, 5, 8 and 10 mg. of the growth substance per 100 c.c. of water. Some of the concentrations were omitted with some plants, but always an ample range was tried. The effective range of treatment as given applies to the specific conditions under which these tests were conducted and the nature of the cuttings at the time of the test. Varying conditions would undoubtedly alter to some extent the effective range. Other growth substances than the most effective are indicated where used.

The date the cuttings were taken as given in the table applied to the particular set reported. Cuttings were often taken on other dates, but the set that gave the most outstanding results is the one reported. The length of treatment was often varied for the different times of taking to fit the condition of the wood. The length of treatment given applied to the particular set reported. It is not meant to imply that this is always the best length of treatment for the concentration suggested.

The days of rooting reported may show some discrepancy from that ensuing in general commercial production. This can be accounted for by the fact that the cuttings were rooted in benches in a north lean-to greenhouse rather than in a hotbed. No bottom heat was used. The percentage of rooting given was for the particular day the cuttings were removed from the rooting medium. A few days or a week either way might have altered the rooting percentage considerably. Often, in a few more days the rooting of the checks would have increased considerably.

Table II shows the effect of indolebutyric acid in relation to the time the cuttings were taken. The most effective concentration and length of treatment varied somewhat, but the influence of the growth substance was of little importance in most cases.

Table III shows a correlation between indolebutyric acid and some of the trade name substances on cuttings of two widely different plants. Others were tried, but these two are representative of the data recorded.

Table IV contains a list of fifty-three plants whose cuttings did not respond to the treatments given. Treatment resulted in burning and death of the cuttings in some cases. The lack of reaction of some was undoubtedly due to unfavorable environmental conditions. Since all cuttings were handled in the same greenhouse, it was not always possible to maintain the most favorable temperature and humidity for all cut-

TABLE I. EFFECT OF SYNTHETIC GROWTH SUBSTANCES ON THE ROOTING OF CUTTINGS OF WOODY ORNAMENTAL PLANTS

Plant	Number of cuttings per plot	Most effective growth substances: Material	Concentration Milligrams per 100 c.c. H_2O	Range	Other growth substances used in test	Date cuttings taken	Length of treatment Hours	Days for rooting	Percentage rooted: Check	Treated
Acanthopanax pentaphylla	10	Indolebutyric acid	10	—	Indoleacetic, Methyl indolepropionate	8/19	20	55	50	80
Acer palmatum	30	Indolebutyric acid	5	—	———	6/25	20	42	0	20
Ampelopsis tricuspidata	20	Indolebutyric acid	3	1-3	———	8/4	24	20	90	90
Berberis Thunbergii atropurpurea	20	Methyl indolepropionate	10	—	Indolebutyric Indoleacetic	8/12	24	44	0	45
Berberis Thunbergii pluriflora erecta	25	Indolebutyric acid	1	1-8	———	7/7	6	47	32	47
Celastrus scandens	25	Indolebutyric acid	3	1-3	———	7/7	6	50	0	100
Cornus sanguinea	25	Indolebutyric acid	3	3-5	———	6/29	12	21	44	68
Evonymus alatus	25	Indolebutyric acid	1	1-3	———	6/24	18	41	44	76
Evonymus europæus	10	Indolebutyric acid	10	—	Indoleacetic, Methyl indolepropionate	8/12	21	43	0	80
Evonymus patens	25	Indolebutyric acid	1	½-3	———	7/24	24	26	16	100
Evonymus radicans	20	Indolebutyric acid	10	—	Indoleacetic, Methyl indolepropionate	8/19	21	36	65	80
Evonymus radicans coloratus	30	Indolebutyric acid	3	1-5	———	6/28	6	21	100	100
Evonymus radicans minimus	30	Indolebutyric acid	10	5-10	Indoleacetic, Methyl indolepropionate	8/12	24	43	87	100
Evonymus radicans vegetus	20	Indolebutyric acid	10	—	Indoleacetic, Methyl indolepropionate	8/18	21	36	65	80
Forsythia suspensa	30	Indolebutyric acid	5	1-5	———	6/22	6	27	40	80
Hedera helix	25	Indolebutyric acid	3	1-8	———	7/5	4	15	96	100
Hibiscus syriacus	25	Indolebutyric acid	5	1-8	———	7/5	6	36	52	100
Hydrangea petiolaris	25	Indolebutyric acid	3	3-8	———	7/28	22	60	0	16
Hydrangea quercifolia	10	Indolebutyric acid	3	1-3	———	7/8	10	50	0	40
Ilex crenata	15	Indolebutyric acid	3	1-3	———	8/10	24	51	0	53
Ilex glabra	25	Indolebutyric acid	5	1-5	Phenylacetic, Indoleacetic, Naphthaleneacetic, Methyl indolepropionate	7/8	24	31	4	96
Ilex opaca	15	Indolebutyric acid	3	3-5	———	6/24	24	43	0	53
Juniperus horizontalis plumosa	25	Indolebutyric acid	2	2-5	———	2/4	18	20	64	72
Kolkwitzia amabilis	25	Indolebutyric acid	8	5-8	———	6/30	10	40	4	92
Ligustrum ibolium	25	Indolebutyric acid	5	1-8	———	7/5	6	32	72	76
Ligustrum Ibota Regelianum	30	Indolebutyric acid	5	1-5	———	6/24	6	46	87	93
Ligustrum vulgare	25	Indolebutyric acid	3	3-10	———	7/9	5	32	16	64
Lonicera Korolkowii	10	Indoleacetic acid	10	5-10	Indolebutyric	11/14	40	53	50	80
Pachysandra terminalis	25	Indolebutyric acid	3	1-5	———	6/22	6	28	60	100
Philadelphus coronarius	25	Indolebutyric acid	5	3-8	———	7/6	20	14	8	56
Physocarpus opulifolius	10	Indolebutyric acid	5	5-10	Indoleacetic	11/14	40	53	80	90
Prunus tomentosum	25	Indolebutyric acid	1	1-3	———	6/24	6	27	4	84
Pyracantha coccinea pauciflora	20	Indoleacetic acid	5	5-10	Indolebutyric	11/11	24	48	60	75
Rhodotypos kerrioides	25	Indolebutyric acid	1	1-2	———	7/24	24	30	0	76
Ribes alpinum	25	Indolebutyric acid	8	5-8	———	6/29	12	35	0	44
Rosa Max Graf	30	Indolebutyric acid	5	1-5	———	6/26	2½	24	3	7
Salix discolor	25	Indolebutyric acid	5	1-5	———	6/29	12	21	36	72
Salix incana	25	Indolebutyric acid	1	1-5	———	6/30	6	20	60	96
Stephanandra flexuosa	25	Indolebutyric acid	1	1-3	———	7/1	6	19	88	88
Syringa hybrid, Pres. Grevy	25	Indolebutyric acid	3	1-5	———	6/20	6	47	24	32
Syringa Meyeri	25	Indolebutyric acid	8	1-8	———	7/9	3	56	12	44
Syringa villosa	25	Indolebutyric acid	5	1-5	———	6/20	6	47	80	72
Taxus baccata Washingtonii	10	Indoleacetic acid	5	½-10	———	1/16	12	93	70	80
Taxus cuspidata	20	Indoleacetic acid	5	1-20	———	1/16	12	92	85	100
Taxus cuspidata	30	Indolebutyric acid	3	1-5	———	6/22	6	97	77	90
Taxus cuspidata nana	10	Indoleacetic acid	5	1-5	———	1/16	12	93	30	50
Taxus media Hicksii	10	Indoleacetic acid	5	½-10	———	1/16	12	93	30	80
Taxus media Hicksii	30	Indolebutyric acid	5	1-5	———	6/22	6	98	43	40
Viburnum americana	25	Indolebutyric acid	1	¼-2	Naphthaleneacetic	8/26	24	32	88	92
Viburnum Carlesii	25	Indolebutyric acid	3	1-5	———	6/22	6	16	15	64
Viburnum dentatum	25	Indolebutyric acid	3	1-5	———	6/25	16	25	56	96
Viburnum dentatum	20	Indolebutyric acid	10	5-10	Indoleacetic, Methyl indolepropionate	8/25	24	31	30	95
Viburnum Lantana	25	Indolebutyric acid	1	1-3	———	7/1	6	19	88	88
Viburnum Opulus	25	Indolebutyric acid	1	1-3	———	6/24	6	21	76	100
Viburnum Opulus nana	25	Indolebutyric acid	3	1-5	———	7/9	5	31	96	100
Viburnum Sieboldii	25	Indolebutyric acid	1	1-3	———	7/23	24	31	48	84
Vinca minor	25	Indolebutyric acid	1	½-4	———	8/5	24	19	84	100
Vitex Negundo incisa	25	Indolebutyric acid	2	¼-3	———	7/30	24	22	4	64
Weigela hybrida	20	Indolebutyric acid	5	5-8	Indoleacetic, Methyl indolepropionate	8/25	24	31	30	95
Weigela rosea	25	Indolebutyric acid	5	1-8	———	6/29	12	20	0	72

TABLE II. EFFECT OF GROWTH SUBSTANCES IN RELATION TO TIME OF TAKING CUTTINGS

Plant	Number of cuttings per plot	Most effective growth substance: Material	Concentration Milligrams per 100 c.c. H_2O	Range	Date cuttings taken	Length of treatment Hours	Days for rooting	Percentage rooted: Check	Treated
Viburnum Opulus	25	Indolebutyric acid	1	1-3	6/24	6	21	76	100
Viburnum Opulus	25	Indolebutyric acid	1	1-3	6/28	6	22	100	100
Viburnum Opulus	25	Indolebutyric acid	1	1-3	7/6	6	14	96	96
Viburnum Opulus	25	Indolebutyric acid	1	1-3	7/12	6	28	76	84
Viburnum Opulus	25	Indolebutyric acid	½	½-2	7/20	24	20	68	80
Viburnum Opulus	25	Indolebutyric acid	1	½-2	7/27	24	27	56	60
Viburnum Opulus	20	Indolebutyric acid	1	—	8/3	24	24	90	80

tings, since their requirements vary considerably. The majority of the cuttings were in a satisfactory condition for a sufficiently long time to root. With some of the plants in the list from one to five per cent of the cuttings rooted, but this was not considered significant.

Conclusions.

1. Concentration and length of treatment.—As would be expected, a weaker concentration and shorter periods of time have been found effective with the more succulent cuttings. An analysis of table I shows that 1, 3 and 5 milligrams of growth substance per 100 c.c. of water with treatments of six or twenty-four hours have been most effective. The exact concentration should be based on the maturity of the cuttings. A good propagator will soon be able to judge the general condition of his cuttings and treat accordingly, the more mature and harder the wood, the stronger the concentration or longer the length of the treatment.

2. Increases in percentage of rooting and amount of roots. Decrease in time required.—Table I will show for the most part that there has been an increase in the percentage of rooting during a given period. The saving in time of rooting with treatment will vary from a few days to as much as two or three weeks. It is doubtful if a period of a few days to a week's difference in the rooting period would be an important factor in the minds of most commercial nursery propagators. The more uniform and abundant root system on the treated cuttings has been striking in many cases. How important such a mass of roots may be and whether such a root system is superior to a few, strong fibrous roots, as usually results from good commercial methods of propagation, have not been determined.

3. Rooting of difficult types.—Table I will show comparatively few types of plants which are really difficult to root from softwood cuttings.

In fact, these tests have given little indication that truly difficult rooting types have been greatly benefited by the treatments. Table IV lists some of these difficult types, as well as some others, which have not responded. Lack of response may be due to unfavorable methods of treatment, which have resulted in injury in some cases. Possibly the use of different growth substances than those employed or a modification of the concentration and length of treatment might result in a favorable response. Much more work needs to be done, especially on the more difficult rooting types.

4. Relation of treatment to time of taking cuttings. — One interesting point in table II is the greater response resulting in the earliest treatment. Possibly the explanation of this lies in the greater content of the plant hormones in the cutting during the earlier stages of growth. Avery and his coworkers have shown that the maximum content of the plant hormones in the shoot is just prior to the most rapid expansion of the current season's growth. After this, there is a gradual decrease during the summer. From this it might be assumed that the greatest response to the growth substances would occur at this period of most rapid expansion.

5. Relation of synthetic growth substances and trade name materials. —From the work done at Ohio State there seems to be no significant difference in the results secured between the use of the crystals of the acids and esters and the trade name materials employed. Data in regard to this correlation are contained in table III. The choice might therefore depend upon the propagator's desire for a cheaper material or more convenience in the preparation of the solutions.

TABLE IV. CUTTINGS NOT RESPONDING TO TREATMENT.

Abelia grandiflora
Acer campestre
Arctostaphylos Uva-ursi
Aronia arbutifolia
Azalea dahurica mucronulata
Benzoin æstivale
Calycanthus floridus
Carpinus Betulus
Chamæcyparis obtusa
Chamæcyparis pisifera aurea
Cornus florida rubra
Cornus mas
Cotoneaster adpressa
Cotoneaster apiculata
Cotoneaster Dielsiana
Cotoneaster divaricata
Cotoneaster foveolata
Cotoneaster horizontalis
Cotoneaster moupinensis
Cotoneaster Simonsii
Cotoneaster Zabelii
Cratægus cordata
Cydonia japonica
Daphne Cneorum
Deutzia Lemoinei
Elæagnus pungens reflexa
Exochorda grandiflora
Halesia tetraptera
Ilex crenata latifolia
Juniperus chinensis Pfitzeriana
Juniperus excelsa stricta
Juniperus Sabina Von Ehron
Juniperus virginiana
Juniperus virginiana globosa
Juniperus virginiana Keteleeri
Larix decidua
Magnolia Kobus
Mahoberberis Neuberti latifolia
Malus Arnoldiana
Malus purpurea
Myrica caroliniensis
Pinus densiflora umbraculifera
Pinus Strobus
Prunus Pissardii
Prunus subhirtella pendula
Quercus Robur fastigiata
Rhamnus Frangula
Taxus baccata repandens
Taxus cuspidata capitata
Thuja orientalis aurea nana
Ulmus pumila
Viburnum Lentago
Viburnum rhytidophyllum

The present status of the work would indicate that the use of synthetic growth substances is not a cure-all for the difficulties involved in the propagation of plants by cuttings. The materials should be used with caution and directions, wherever possible, followed carefully. Much more experimental work must be done before all the questions concerning the use of these materials can be answered. The commercial propagator should proceed accordingly with their use.

Precautions.

Variations are bound to occur from the use of these materials by individual propagators. Atmospheric and cultural factors will vary, leading to different results. Such factors as the amount of leaves on the cutting, the amount of light preceding the time of taking the cuttings, and the nitrogen content, will influence their reaction to treatments. It is possible that cuttings taken after a period of dark, cloudy days will have to be treated with a stronger solution or for longer periods, or both, while cuttings taken during a prolonged sunny period will respond to a weaker concentration and a shorter treatment. I should expect cuttings of greenhouse plants taken from November to May would respond differently. Possibly the same will be true for cuttings of woody shrubs taken from early June to late August.

It should be understood by commercial propagators that, because cuttings of a certain plant respond to a treatment of indolebutyric acid, it is no assurance that similar cuttings will respond to a corresponding treatment of indoleacetic acid. Variations will occur and must be expected.

Commercial propagators must decide for themselves whether the benefits derived from the treatments are important enough to warrant the practice. Is the saving of a few days or a week important? Will the production of a few more roots lead to a more rapid growth and a better mature plant? Little information is available at present on what effect the growth substances have on the growth and final development of the plant.

TABLE III. CORRELATION BETWEEN INDOLEBUTYRIC ACID AND TRADE NAME SUBSTANCES

Plant	No. of cuttings per plot	Growth Substance Material	Concentration Mg. per 100 c.c. H_2O	Date cuttings taken	Length of Treatment	Days for rooting	Percentage Rooted Check	Percentage Rooted Treated
Gardenia Veitchii	25	Indolebutyric acid	1	4/23	3	53	—	60
Gardenia Veitchii	25	Indolebutyric acid	3	4/23	3	53	—	88
Gardenia Veitchii	25	Indolebutyric acid	5	4/23	3	53	—	88
Gardenia Veitchii	25	Hormodin A.	As recommended	4/23	3	53	—	80
Gardenia Veitchii	25	Kak	"	4/23	3	53	—	84
Gardenia Veitchii	25	Check	——	4/23	3	53	56	—
Acanthopanax pentaphyllum	25	Indolebutyric acid	½	7/27	24	23	—	68
Acanthopanax pentaphyllum	25	Indolebutyric acid	1	7/27	24	23	—	96
Acanthopanax pentaphyllum	25	Indolebutyric acid	2	7/27	24	23	—	92
Acanthopanax pentaphyllum	25	Auxilin	As recommended	7/27	24	23	—	96
Acanthopanax pentaphyllum	25	Check	——	7/27	24	23	60	—

"PICTURE PLANTING."

So expressive is the title, "Picture Planting," of a booklet recently issued to its customers and prospects by the F. & F. Nurseries, Springfield, N. J., that one wonders it has not been more widely used to convey nurserymen's service. But perhaps this thought is inspired by the text and illustrations, for they emphasize the skill in design and arrangement which makes of home plantings something more than an aggregation of nursery products. Of twenty-four pages, 9x12 inches, the booklet is bound in green heavy paper cover. Most of the pictures are in black and white, but a few in colors. They reënforce the brief paragraphs of text. Perusing the pages, the home owner not only will get some ideas about his grounds, but will derive inspiration to plant more intelligently and will have

larger respect for the service the nurseryman renders.

In the page of "chat about the way we plant our pictures," is told briefly, but comprehensively, the service involved:

First we come to your grounds. Make a study from various viewpoints. Consider your present planting—if any. Give thought to the lines of your residence, its architecture and what planting will best complement it. Then we make a colored plan for you, which we will go over with you at your leisure. The plan indicates the stock used and its placing, but does not enumerate quantities. That's because we are not offering you so many tubes of paint, in terms of so many plants. We are guaranteeing you a picture, or a series of pictures.

You buy the complete picture planting for so much. After which we plant the picture. That's about all there is to it. We make quite as many such pictures in the fall as during the spring.

In addition to the booklet on "Picture Planting" the F. & F. Nurseries have sent to their mailing list this season 4-page folders about individual plants, interestingly telling about such items as magnolia, hawthorn, etc.

Of course, such excellent advertising material is to be expected of the firm that celebrated its fiftieth anniversary in 1932 by issuing a special edition of 2,400 copies of a book of more than 200 pages just describing the products of its nurseries. Less than a catalogue in that it contained no prices, the book was more than a catalogue in the accuracy and helpfulness of the plant descriptions.

TRAILER MOVES BIG TREES.

Speed and labor-saving in moving big trees on landscape contracts were gained by Swain Nelson & Sons Co., Glenview, Ill., this season by the use of a trailer of their design manufactured for their use by the Fruehauf Trailer Co., Detroit.

The nursery makes a specialty of moving large trees for transplanting. The balls of soil around the roots, held intact by heavy burlap, range from six to twelve feet in diameter and from two to three feet in depth, the trees, with the soil, weighing from eight to ten tons. As they are unwieldy to handle, much time and labor were required in the loading and unloading when the standard truck or trailer was used.

Two Fruehauf drop-frame extra-heavy duty trailer carryalls were built to meet the company's exact requirements, with specially designed and extra-low platform bodies, with removable sides. After removing the sides it was found a simple matter to roll, with ropes, the ball of soil unto the platform. Then the sides were replaced and the load was delivered to its destination, where the lower platform also made easier and quicker unloading. It is said that fully one-half of the former loading and unloading time and labor is saved. The illustration on this page shows one view of a trailer with the sides removed and a view with the sides replaced.

The company employs the trailers in shuttle operation. A single 1½-ton Ford tractor truck is used for the two trailer units, the tractor delivering one load while the other trailer is being loaded, then returning for the loaded trailer and leaving the empty, thus conserving still further valuable time. When not hauling large trees, the trailers are used for carrying evergreens, shrubs and other nursery products.

AUTUMN PLANTING.

Autumn planting has definite advantages. It lightens the pressing load of spring work. The autumn air and soil temperatures favor transplanting, as the air is cooler than the soil, producing a "bottom heat" effect as in a hotbed. This helps the plants to become well established in the soil before spring. Since hot, dry weather does not usually follow fall transplanting, the plants may not wilt or die.

But there are also disadvantages. If the weather is dry, the cold air easily penetrates the soil and may cause considerable root injury. If wet weather follows planting, the plants may be raised by the heaving, which breaks many of the roots. Heaving is most serious in heavy, clayey soils, and small fruits are more susceptible than trees.

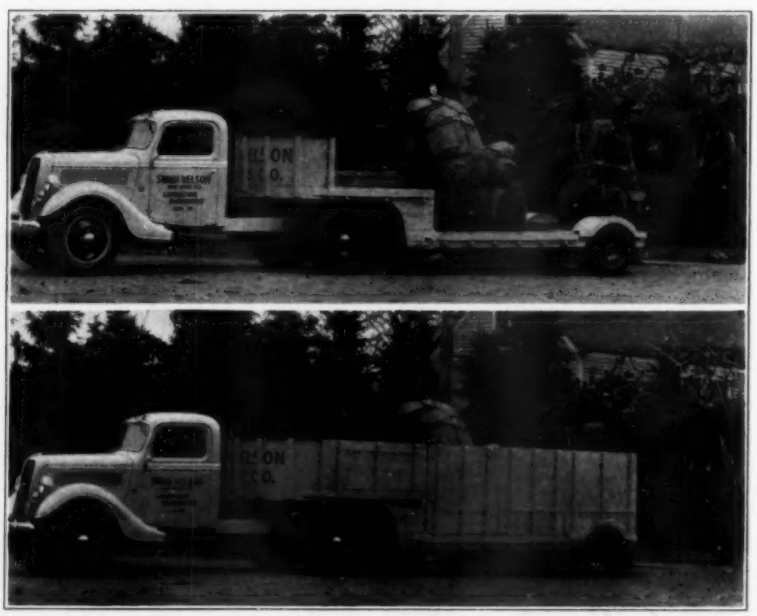
Consequently, when plants are set in the fall in northern states, special care should be taken to firm the soil about them and to mulch them with straw or other materials.

ACER MULTIFIDUM.

(Concluded from page 2.)

made in August and the young plants overwintered in protected frames or a cold greenhouse. Layering is rarely employed. The small nurseryman will find it advisable to buy his stock from a specialist.

With its wide adaptability, this ornamental shrub should be planted more freely in sections other than that along the Atlantic seaboard. The cut-leaved Japanese maple should prove hardy in all but the severest section of this country, which roughly takes in northern Michigan, virtually all of Wisconsin and Iowa, all of Minnesota, the Dakotas and Montana and northern Nebraska, Wyoming and Idaho. Obviously, when planted along the northern limit, the shrub should be given a protected location.



Trailer for Moving Trees Shown with Sides Removed and in Place.

Native Plants of Garden Value

Twentieth in Series of Articles on Neglected Opportunities for Nurserymen in Native Material—By C. W. Wood

Some of the rudbeckias, or coneflowers, are quite well known, especially Golden Glow, which was formerly grown in almost every garden, while others of equal or even greater value have had little attention from gardeners. It is true that they are mostly coarse plants and have to be used with discretion, but for certain situations where masses of one species can be used, there are few more satisfactory flowers of their season. I know a garden where R. speciosa, Campanula lactiflora and blue hardy asters make the commanding picture in July, August and September. Numerous other landscape associations are possible, using different rudbeckia species for the yellow and orange shades. So far as culture is concerned, these coneflowers have everything in their favor, for, although some of them grow naturally in rather moist soil, they do well in almost any soil or situation given them. They do best in sun, to be sure, but accommodate themselves to partial shade, and even the varieties preferring moisture give a good account of themselves in a dry border. They grow readily from seeds, which means of increase is perhaps to be preferred in most cases, but the improved forms and those with fully double flowers have to be grown from divisions or cuttings. The latter are easily rooted in the ordinary way by pulling away shoots in late spring.

In addition to Golden Glow and black-eyed Susan, both of which are well known, the following rudbeckias will be found desirable: R. speciosa (R. Newmanii of some lists) has large (three inches or so across) heads of yellow to orange yellow flowers on 2-foot plants from July to October. R. californica is somewhat variable as to size and rather tender, but an excellent plant for warmer sections, with large, yellow flowers on medium-size plants. R. nitida is a southern plant, too tender for northern Michigan, and the variety Herbstsonne appears to be slightly hardier, but would scarcely be reliable north of Chicago; it reaches up to seven feet in height and produces abundantly its bright yellow coneflowers. It and the type show in their drooping petals and columnar disk a close relationship to lepachys. In R. subtomentosa, the bright lemon yellow ray petals and dark purple centers are pleasing and may be used where the golden yellow and orange of others would be out of place; its height is three feet. R. fulgida, as originally described and as usually seen, has orange yellow flowers. A strain of so-called hybrids is now available which produce a number of shades in orange and yellow, many of the flowers having central rings of brown and red brown, while others are tipped with the latter colors. This has shown itself to be an excellent plant in my garden, blooming the first year from early-sown seeds and flowering close to two months. In fact, one lot that is in the irrigated area blooms from June or early July until frost.

Romanzoffia.

The waterleaf family is a rather small one, and its number of good garden plants is even more limited. The only important genera that come to mind at present are phacelia and nemophila, and they are mostly annuals of the far west. Romanzoffia is confined entirely to the Pacific regions from California to Alaska, where upward of ten species are recorded. R. sitchensis and its even smaller counterpart, R. Suksdorfii, the only ones that I have grown, are two little beauties for the careful gardener. They require shade and constant moisture in eastern America, preferably in a soil that contains plenty of leaf mold and that drains readily. Given those conditions, romanzoffias should not be hard to grow in cooler sections, but I should expect trouble in hot climates. The plants are made up of small, dark green, scalloped leaves growing in tufts, from which spring 3-inch to 6-inch stems bearing racemes of fragrant, velvety white flowers. They are too difficult for the average gardener and should not be sold unless the purchaser has the facilities and knowledge to make them thrive. They are, nevertheless, worth the effort needed to attain that state. Seeds germinate readily and offer the best means of propagation.

Ruellia.

Ruellia is a genus of 200 or more species, nearly all being tropical plants and of no interest in our present enumeration. A few species have strayed into the temperate zone, and one of these, Ruellia ciliosa, offers the gardener one of his best August-blooming plants for rock garden use. The plant grows naturally from New Jersey west to the plains country and southward, always in dry, well drained soil, I believe. That gives us a reliable clue to the plant's cultural needs and contains its only requirements so far as I have found. It is said to grow eighteen inches high farther south, but is seldom over six or eight inches tall in my soil. The plant is made up of numerous stems bearing hairy, oblong leaves, in the axils of which are produced large, petunia-like, lavender blue flowers all during August and part of September. This is an easily grown plant that can be put in the care of the most ignorant planter, provided he understands the need of perfect drainage. It is moved easily at any time of year and grows readily from autumn-sown seeds. It should become immensely popular when better known.

Scutellaria.

Many of the skullcaps, especially the ones that grow naturally in dry soil, are good garden plants, blooming in summer when color is appreciated and demanding little care. Plants which possess these qualities are so rare that one would naturally expect to find all available ones being made use of, yet a careful search of plant lists will rarely reveal more than two species, Scutellaria alpina, of Europe, and S. baicalensis, of Asia. The genus is quite plentiful in America, and among our native kinds a number of good garden ornaments will be found. Some of these, like S. angustifolia of our northern states, prefer a moist situation and are likely to find little demand among garden-

ers, for there are few of us who have moist spots available, but there are a number of really good dry-soil species which could well be made a part of our programs. Of the latter, S. resinosa and S. Brittonii suggest themselves as being a good starting point in a search for good native skullcaps. They are quite similar in growth, being much-branched plants to a height of eight inches, with good foliage throughout the season and flowers from June onward. The flowers, which are axillary, keep coming as the stems grow in length, giving color well over two months. The only difference in the two mentioned, so far as garden uses are concerned, is that the first has pure bluish purple flowers and S. Brittonii is blue purple with a white lip. Both are easy to grow in a dry, sunny spot and will thrive and flower under more drought and heat than almost any other plant that comes to mind. Propagation is from seeds.

Sedum.

Because some sedums are so easily grown and, consequently, so often dominate rock garden plantings, the entire group of stonecrops has fallen into disrepute among the landscape fraternity. That is not as it should be, because the genus holds some excellent landscape material, not all of which is of foreign extraction. The United States is the home of more than fifty species, and Mexico has more than twice that number. The latter are, of course, ruled out of a discussion of hardy plants, though I have found a few from the high mountains of that country which withstand temperatures close to zero if they are kept perfectly dry. Of our own species, many are of interest only to the collector; others, like S. spathulifolium, S. yosemitense and others of that ilk, are too difficult for our eastern climate, and some have little garden value. I should like to draw attention, however, to a few easily grown kinds which are restrained enough to fit into the small garden and possess landscape qualities in no mean proportion. Perhaps my favorite of the hardy dependable species is S. divergens, a plant that seems to be much confused in nurseries, being generally labeled S. oreganum when it is present at all, though I have seen it marked S. obtusatum. There is not space to go into the details regarding the distinguishing characters of these three plants, but it may be said that the last-named is not in commerce so far as I know and that the spathulate leaves and long, quite erect petals of S. oreganum mark it off from our present plant, which has opposite, bead-like leaves and wide-spreading petals. The value of S. divergens as a garden plant lies in the year-round red foliage and stems (at least as it behaves with me) and its display of old gold flowers in early summer. It makes an ideal ground cover for small hardy bulbs that have to be kept dry while they are dormant and is an excellent rock garden ornament, its height of two to four inches insuring correct stature for such situations.

Sedum ternatum, which appears to be generally correctly named, needs no comment except to recommend it for wider use in gardens. It is an excellent plant for moist situations or for leaf mold soil in shade, a rather unusual character in a sedum. The same may be said of a close relative, S. Nevii, although I find the latter a little harder to manage in my northern location. It appears to be slightly tender to cold and sometimes rots during winter and spring. Both are good garden plants, being pleasing in foliage (green in the former and reddish at times in the latter) and in their white flowers.

I wish space permitted entering into a discussion of the S. pulchellum tangle. The perennial form, which Professor Wherry has shown is not entitled to the name pulchellum and for which he has suggested the old De Candolle name pulchrum until its current status is ascertained, is a splendid little plant, resembling in many ways the little winter annual of southern states. I am including the perennial form here because it bears the name of an American species and, further, because it is one of the most pleasing sedums I have ever grown. It makes tufts of bright green, linear, terete leaves, and its 4-parted flowers in summer are deep rose. It does best for me in situations that are too moist for most sedums.

ROOT injury to strawberries occurs in winter or in late fall, and to prevent it, plants should be mulched before the first hard freezing weather arrives. Fine marsh hay is recommended, and the foliage should be entirely covered.

HIT REORGANIZATION BILL.

National conservation groups, representing agriculture, forestry and wild life, have launched an attack on the conservation provisions of the government reorganization bill, Senate bill 2970, scheduled to be taken up by the coming special session of Congress.

According to the American Forestry Association, one of the fifty national organizations in the attack, the provisions strenuously objected to by the conservationists would create a Department of Conservation by "bestowing that name upon the old Interior Department and by giving the President power to transfer thereto any conservation agency of the government except the engineer corps of the Army and the Mississippi river commission." They would also give the President power to appoint, irrespective of civil service, the "head of any bureau, division, service or other similar agency," which in his judgment is "policy determining in character," thus opening the door to political patronage in filling important positions in the conservation services.

Conservation leaders, the association pointed out, recognize the need for intelligent regrouping of agencies dealing with renewable resources, but they will fight to the bitter end any effort to transfer the forest service, the biological survey, or the soil conservation service from the Department of Agriculture, where it is held agencies dealing with plant, animal and soil conservation logically belong.

Among the many organizations which have taken a stand against separating forestry from agriculture are the National Grange, the Izaak Walton League of America, the Society of American Foresters, the American Farm Bureau Federation, the American Paper and Pulp Association, the Association of State Foresters, the American Association for the Advancement of Science and the National Coöperative Council.

INJURIOUS effects of changing grades, particularly raising the grade around trees, can be minimized to a large extent by using a light, gravelly or sandy soil, rather than one containing clay. The latter shuts off the air from the tree roots, and even a relatively small fill with clay may be fatal.

Three Rusts on Cedars

Most Important of the Various Rusts on Junipers Are Those Infecting Apple, Quince and Hawthorn as Alternate Hosts

There are several rusts which attack various species of juniperus upon which little if any material damage results. These rusts, however, have the habit of requiring hosts other than cedar for the completion of their life cycle. These alternate hosts are absolutely necessary for the survival of the fungi which cause these diseases, since the spores produced on one are unable to reinfect the plant upon which they are borne; they infect the alternate hosts only. Consequently, if either of the alternate hosts are removed the fungus cannot survive.

These rusts all belong to the fungous genus gymnosporangium, and the cedar hosts are Juniperus virginiana and many of its varieties, J. Sabina, J. scopulorum, J. communis and J. sibirica. The alternate hosts for these rusts are found in the genera pyrus, including the cultivated apple, pear and ornamental crab; cratægus, amelanchier, cydonia, sorbus, aronia and others of less importance, all belonging to the order rosales.

There are at least seven of these rust fungi attacking juniperus, but three are of prime importance and are generally confused in the minds of nurserymen. An attempt will be made to give the distinguishing characters of these three rusts, their life histories and the available data on control. The three rusts to be described are the cedar-apple rust, caused by Gymnosporangium juniperi-virginianæ; the quince rust, caused by Gymnosporangium clavipes (germinale), and the hawthorn rust, caused by Gymnosporangium globosum.

Cedar-Apple Rust.

The cedar-apple rust is one of the economically important diseases of commercial apple orchards and as such has received a great deal of attention by the fruit pathologist.

Spores produced on the apple or other alternate host infect the cedar host during July and August. The fungus passes the winter on the cedar host. In some cases the infection may not be visible until the following spring, but in others small brownish gall-like growths are produced in the fall in the axils of the leaves of cedar on the current season's growth.

The following season these galls increase rapidly in size often reaching a diameter of two inches, but more generally one to one and one-half inches. They are brownish in color, corky in texture, spherical to kidney-shaped and relatively smooth. These galls remain dormant until the following spring, almost two years after infection took place on the cedar. The galls now become pitted and during the latter part of April or early in May, as the foliage of apple is being produced, each pit gives rise to a long finger-like projection. These growths from the cedar gall are made up primarily of two-celled spores, which do not germinate until a period of rainy weather. During such periods the spore horns become gelatinous and orange brown, and the spores themselves germinate, producing a short germ tube, on which, in turn, are produced four smaller secondary spores. This process quadruples the number of spores able to infect the apple. It has been calculated that a single medium-size cedar gall will produce as many as seven million such spores. A period of dry weather will dry up these gelatinous spore horns, but they may again become gelatinous and spore-producing with the advent of a second rainy period, or even a third.

Sales of evergreens have been hindered in some sections of the country recently by apprehension on the part of the public with regard to the rusts which attack some species of junipers, in consequence of publicity regarding the damage done to apple trees by the spread of the fungus from the cedar to the alternate host. In meeting the questions of customers, nurserymen receive timely help in this thorough review of cedar rusts, just completed in three issues of nursery disease notes issued by the department of plant pathology of the New Jersey agricultural experiment station. The most complete compilation of data on this matter is given by Crowell in the proceedings of the American Society for Horticultural Science, volume 32, 1934. Other observations by Crowell appeared in the Journal of the Arnold Arboretum, volumes 15 and 16.

These secondary spores are small and are carried by wind and insects for long distances to the developing apple foliage and fruit. Heavy infection on apple has been found three-quarters of a mile from the nearest cedar trees.

These secondary spores from cedar germinate at once on the upper surface of apple foliage and cause infection. The fruit at this time is still standing erect and the majority of infection on the fruit, therefore, occurs on the blossom end. About ten days after infection, light yellow spots occur on the leaves, which gradually increase in size, become bright orange yellow and eventually are dotted on the upper surface with minute black specks. In late June or July, pustules occur on the under-surface of these spots growing out into tube-like projections, which eventually open, exposing a mass of orange brown spores. It is these spores that are carried back to the cedar, causing infection in the axils of the leaves of the new growth and thus completing the life cycle. Similar spores are produced on infected fruit, and in rare cases on infected twigs. These spores are unable to reinfect the apple just as the spores produced on cedar are unable to reinfect the cedar. Both hosts are absolutely necessary to the perpetuation of the fungus.

The damage to cedar is negligible. Heavy infections on cedar frequently kill the twigs beyond the galls, but no further damage results. On the alternate hosts, however, the damage is severe. Heavy infections on the foliage result in early partial or sometimes complete defoliation, drastically weakening the tree. Two or three seasons of such defoliation generally result in death, through borer attack. In commercial apple orchards a high percentage of the fruit may be rendered unsalable.

Juniperus virginiana and its many varieties are the chief offenders, although other species and varieties have been proved susceptible. It should be stated that within the native species J. virginiana, a great variation in susceptibility is apparent.

In native wild stands of red cedar, certain trees will be found heavily infected and carrying large numbers of cedar galls, while neighboring trees will be entirely free.

According to Crowell, all rosaceous hosts of this rust fall in the genus malus, including many orchard varieties of apple and many ornamental species. Some species of malus were found to be susceptible to infection, but failed to produce spores for retransfer of the fungus back to cedar. None of these species were native to America, but all were species introduced from Eurasia. Likewise, in the orchard varieties of apple a wide range of susceptibility is evident.

The elimination of one or the other of the alternate hosts will necessarily result in control on the remaining host, due to the necessity of this rust of passing from one host to another. In view of this fact, a few states with extensive commercial apple orchards have passed laws pertaining to the protection of these orchards, by requiring the removal of all wild and cultivated susceptible juniper hosts. West Virginia, Arkansas and Nebraska have such laws, and New Jersey senate bill 167, 1936, which failed of passage, declared this rust to be a public nuisance and proposed to remove all susceptible juniper hosts within one mile of all commercial orchards of 100 trees or over. The West Virginia law requires the removal of red cedars within three miles of apple orchards, and the Nebraska law within two miles.

The early results of spraying the rosaceous hosts, mainly apple, in an attempt to effect control were not on the whole promising. Favorable control has been reported from time to time, however, from West Virginia, Wisconsin and other states. Crowell conducted rather extensive trials in Massachusetts and as a result states that "both apple trees and red cedars may be grown in close proximity and at the same time be practically free from gymnosporangium rusts."

Many horticultural varieties of apples are highly resistant and can be grown successfully and free from rust in close proximity to cedars. All native species of juniperus except virginiana, horizontalis and scopulorum and their varieties, and all introduced species have proved immune, so that by a selection of either the rosaceous hosts or the juniperus hosts, in adjacent plantings, rust may be satisfactorily eliminated.

Crowell likewise obtained satisfactory results by spraying with colloidal sulphur. The time of application was found to be extremely important and should coincide with the gelatinization of the spore horns on the cedar galls. Five applications are required and on ornamental trees, such as the susceptible Bechtel's crab, it may be practical to follow such a schedule. The first application is made after the buds have opened and before the first expected rainfall. A second application should be given four to seven days later, a third seven to ten days after the second and the fourth and fifth applications in 10-day or two-week intervals, depending upon the frequency of rains.

Hamilton, working in the Hudson valley, has also shown that cedar-apple rust may be controlled commercially on apple by the use of fungicides. Both copper and sulphur sprays were effective, the consistently effective sprays being those that deposited the heaviest and most persistent residues. Due to the danger of copper injury's resulting from Bordeaux and the ineffectiveness of proprietary copper substitutes, finely divided sulphurs, such as flotation sulphur, are recommended by him. Timeliness and thoroughness of applications are stressed, with applications preceding the rainy periods when the spore horns on cedar galls become gelatinous and discharge spores able to infect the rosaceous host. The frequency of applications is not determined by the calendar, but by the rate of growth of the rosaceous hosts and the occurrence of gelatinization of the cedar galls. During rapid growth early in the season, applications may be no wider spaced than three days, later on five to seven days, or even ten to twelve days.

Cedar-Hawthorn Rust.

The cedar-hawthorn rust is caused by Gymnosporangium globosum. The life history is similar to that of the cedar-apple rust. The galls on cedar are produced as a result of infection by spores produced on apple, pear, hawthorn or other rosaceous host, but are smaller than those associated with the cedar-apple rust. Furthermore, they may be perennial in nature, producing wedge-shaped spore horns for several years. These spore horns, dark brown in the spring, but becoming a yellowish brown upon gelatinization, are made up largely of spores, each of which in turn produces four secondary spores that are carried by wind to the susceptible alternate hosts. On leaves and fruit of these alternate hosts a still different spore form is produced which infects the cedar. The following season galls are formed on the cedar and the next spring (almost two years after infection) another crop of spores is produced.

The cedar hosts of this rust are Juniperus horizontalis, Sabina, scopulorum, virginiana and the Bermuda cedar, J. barbadensis (bermudiana).

The alternate hosts are malus, pyrus, sorbus and over eighty species of cratægus. It is the least important of the three rusts under discussion on apple, being only occasionally destructive, is reported severe on pear in New England and is undoubtedly the most important rust of many cultivated varieties of hawthorn.

On the hawthorn the symptoms are similar to those on apple foliage

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caused by the preceding rust, G. juniperi-virginianæ. Yellow spots appear on the foliage, the upper surface bearing numerous minute black dots, the pycnia. Later on in the season, on the undersurface of these spots, clusters of swollen spots growing out into whitish tubes appear, break open and expose the masses of brown spores. The affected areas of the leaves become brown and if heavily infected fall prematurely.

As with the cedar-apple rust, the removal of either of the alternate hosts would affect a control on the remaining host. No reports are available on control on either host by spraying, but control should be obtained as with the cedar-apple rust if the sprays are timed to precede spore discharge from the gelatinous spore horns on the cedar galls during wet weather.

Cedar-Quince Rust.

The cedar-quince rust is caused by the fungus, Gymnosporangium clavipes (germinale), and the general aspects of the life history are similar to those of the preceding two rusts. However, no galls are produced on the cedar hosts. Instead infection on the cedar results in slightly fusiform swellings of twigs and branches. Infection from the alternate host may take place directly on young twigs, or in needles, from which it grows into the twigs. These swollen areas on the twigs are covered with roughened and darkened bark, particularly noticeable after rains. Infected twigs generally die after producing one crop of spores, but frequently they live and remain infected for several years, the fungus being perennial in the cortex.

On the pomaceous alternate hosts this rust attacks particularly fruit and twigs, although leaves of some species are sometimes infected. The twig and fruit infections are most outstanding.

The earliest symptom on fruit is a pale yellowish green discoloration on the young fruit, which becomes slightly swollen and soon dotted with numerous tiny deep reddish dots, the pycnia or spermagonia of the fungus. The diseased area continues to enlarge and may finally involve the entire fruit, with infection sometimes extending into the peduncles and twigs.

In twenty to forty days from infection, another spore form appears as rather long whitish tube-like outgrowths. These eventually open, exposing the orange brown spore masses. These spores reinfect the cedar.

Twigs and thorns also frequently carry infections, which start as pale yellowish green spots, eventually girdling the stem and extending from one to three inches longitudinally. Swelling of the infected portion results in fusiform or irregular cankered areas. Spore development proceeds as on the fruit.

Damage on the pomaceous hosts is often severe. Diseased apple and quince fruit become misshapen, often fall prematurely and are rendered unsalable. Ornamental hosts such as hawthorn and service berry frequently lose their attractiveness through destruction of the fruit by

(Concluded on page 18.)

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Fruit Outlook for 1938

Factors That Will Affect Next Year's Planting of Fruit Trees, Gleaned from Bureau Report

The average production of all fruits during the next five years (1937-41), according to the bureau of agricultural economics of the United States Department of Agriculture, will probably be larger than the average for the 5-year period (1932-36) just passed. Demand on the other hand will probably average higher, so that total income from fruit production will be somewhat higher.

The outlook for the fruit industry as a whole is considerably influenced by the level of income of consumers. Consumer demand for the total of all fruits combined is such that larger fruit crops tend to result in about the same gross income as do small fruit crops. The citrus industry as a whole cannot expect much improvement in prices as the crop increases with the increase in bearing acreage and, more particularly, the increasing production of trees already in bearing. Apple, pear, grape and peach growers, on the other hand, may expect some improvement in prices.

Oranges.

Of the 34,600,000 bearing trees (5 years old and over) estimated in the groves of California, Florida, Texas and Arizona in 1937, forty-five per cent had not reached full production and twenty-six per cent were in the relatively young group of 5 to 10 years of age. So it seems reasonably certain that the average production during the next five years will be larger than that of the past five years.

Prices received by growers for oranges have continued on a relatively low level since the season of 1929-30. The unfavorable effects of larger supplies of grapefruit in prospect for the next five years and prospective apple supplies, only slightly smaller in recent years, probably will be offset to some extent by an improvement in consumer purchasing power.

Grapefruit.

Bearing acreage of grapefruit has increased rapidly during recent years and the trend of production is sharply upward. Last season (1936-37) when growing conditions were only slightly above average, a record high crop of 30,381,000 boxes was produced, which is eighty per cent above the average production of 16,869,000 boxes during the previous five years. Since only thirty-one per cent of the bearing trees have reached the age of full production, the trend of production during the next decade is likely to continue upward.

Much of the expected increase in production will take place in the seedless varieties of grapefruit. Bearing trees in this group are two-thirds of the total bearing trees of all grapefruit and represent plantings of which only fifteen per cent have reached full production. The seedless varieties predominate in Texas, California and Arizona.

Apples.

Estimating this year's crop of apples at about seventy-five per cent larger than the small crop of 1936 and twenty-five per cent larger than the 1931-35 average production, the bureau of agricultural economics expects a gradual downward trend in apple production in future years. January 1, 1935, there were about 100,000,000 apple trees of all ages in the United States, or less than half the number reported in 1910. Trees of bearing age were reported at 82,500,000. Relatively light plantings during the last ten years indicate a further reduction in trees since 1935.

By 1940 there may be only 74,000,000 apple trees of bearing age, and by 1945 only 66,000,000. But a part of this decrease may be offset by increased yields of the orchards remaining. Roughly, the bureau estimates that with average growing conditions, annual production may be as low as 140,000,000 bushels by 1945, as compared with the present average of about 156,000,000 bushels. In contrast, plantings in foreign countries have been increasing.

Peaches.

Peach production in the United States in the next five years will probably average slightly higher than in 1933-37. But anticipated improvement in demand is likely to at least offset the effect of larger supplies, and prices are expected to continue generally favorable to growers.

The bureau cautioned growers, however, that the danger of overexpansion of the industry should be recognized. Periods of fairly profitable prices in the past have often stimulated planting so that overproduction and severe losses to growers resulted in some districts.

If planting continues at the present or an increased rate over a period of years, the industry from five to fifteen years hence may be faced with burdensome market supplies.

For the United States as a whole and for each of the important peach areas the number of trees in 1935 was near the low point for many years. The upward trend in production is expected chiefly because of the increase in planting in many districts during the past three years and the generally good care orchards are receiving.

Pears.

The trend of pear production is upward, chiefly because of increasing

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production in the three Pacific coast states. New plantings of pears have almost ceased, but there are sufficient young trees to permit the upward trend in production to continue for several years.

Orchards in commercial pear-producing areas of California, Oregon, Washington, New York, Illinois and Michigan were given good care in 1936 and there was little abandonment. Neglect has been general in many other states, where pear growing has been relatively unimportant and proved unprofitable.

Cherries.

Indications are that cherry production, with average growing conditions, will be slightly larger. It is expected that the considerable number of trees yet to come into bearing will probably more than offset any normal losses and abandonment of orchards for the next few years.

There was an increase in the United States of about thirty-five per cent in the number of trees of bearing age from 1930 to 1935. About twenty-five per cent of the total number of trees in the entire country were of nonbearing age in 1935 as compared with thirty-six per cent in 1930. New plantings were heavy during the period 1925-30, when prices to growers were at high levels.

Grapes.

Average production of grapes in the next few years is likely to be slightly larger than the 1932-36 average of 2,100,000 tons, but considerably smaller than the near-record crop of 1937.

Preliminary estimates indicate that the 1938 bearing acreage of grapes in California will be about 487,000 acres, an increase of nearly 19,000 acres over that of 1936. The 1938 bearing acreage is likely to be maintained and perhaps increased slightly during the next few years, since the relatively good prices this season, considering the large crop, are expected to encourage good vineyard care. With average yields, this acreage would produce approximately 1,875,000 tons of grapes.

There has been no pronounced trend in production of grapes in the principal producing regions outside California. Production in these regions during the next few years will probably average near the 1932-36

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average of 267,000 tons, although bearing acreage is likely to decline slightly. Reports indicate that plantings in all eastern regions are light.

Strawberries.

Indications are that strawberry production will be appreciably larger in 1938 than in 1937. Prices to growers will probably average somewhat below the relatively favorable 1937 prices. Prices to growers, which have been increasing since 1933, were slightly higher in 1937 than in 1936, although production in 1937 was about twenty per cent larger than in 1936. October reports indicate a 1938 acreage for picking about twelve per cent larger than the 1937 harvested acreage and only slightly below the average of 1928-32. Beds are reported to be in good condition in most areas and appreciably improved over the low condition of a year earlier.

Exact forecasts of strawberry production several months in advance are not possible because of the influence of such factors as droughts, frosts and excessive rainfall. If the yield per acre in 1938 is as high as in 1937, which appears probable in view of the generally favorable condition of beds, the intended acreage in 1938 would permit of a production of about 320,000,000 quarts. This would be more than ten per cent higher than the 1937 production, which was about equal to the 1928-32 average.

THREE RUSTS ON CEDAR.

(Concluded from page 15.)

this rust and by the killing of the twigs.

The cedar hosts of this fungus are listed by Crowell as Juniperus communis and varieties, horizontalis, Sabina, scopulorum and virginiana.

As a result of extensive inoculations and observational work of Crowell, the list of pomaceous hosts susceptible to this rust now comprises over 480 species and varieties of plants scattered through eleven genera as follows: Amelanchier, amelosorbus, aronia, chænomeles, cratægomespilus, cratægus, cydonia, malus, photinia, pyrus and sorbus. This is the widest range of susceptible genera of any species of gymnosporangium and it is not limited to native plant material, as is evidenced by the susceptibility of the quince, Cydonia oblonga, introduced from Asia; Chænomeles sp., also introduced from Asia, and one European and one Asiatic species of pyrus.

The eradication of one or the other of the hosts will result in control, for, like other forms of these rust fungi, both hosts are essential to the perpetuation of the fungus. Other possible methods of approach to control is by the selection of immune or highly resistant species for planting. All species and varieties of juniperus which have been tested, except virginiana, horizontalis, scopulorum, communis and Sabina, have been found immune to all three rusts and can be safely planted in association with susceptible alternate hosts. Eurasian species and varieties of malus do not harbor nor reproduce this rust, and these may be used safely in association with susceptible coniferous hosts.

Native or introduced species of cratægus, however, cannot be planted in the vicinity of native juniperus hosts with any hope of remaining free from rust. Practically all species of cratægus are susceptible to G. globosum and G. clavipes.

The removal of infected parts of cedars by pruning or surgical means in the case of trunk infections is not practical.

Protective spray applications to the pomaceous hosts have value only if properly timed to coincide with the gelatinous masses of spores produced on the swollen infected twigs, branches and trunks of cedars. It is noteworthy that the fruit of the pomaceous hosts is susceptible to infection for only a short period of time, from the appearance of the blossoms to petal fall. The first application of colloidal sulphur should be made as the cluster buds are breaking. Subsequent applications should follow weekly until the petals have fallen.

PLANT NOTES FOR NORTH.

Physocarpus nana continues to show its great value as a hardy dense hedge of low to medium height, writes W. T. Cowperthwaite, manager of the landscape department of Holm & Olson, Inc., St. Paul, in the Minnesota Horticulturist. It is a true green-leaved ninebark and, in addition to the bright green foliage of the species, it has that essential requirement of a practical hedge shrub, namely, profusion of branches and branchlets which start at the crown and continue to multiply as the plant grows. It works into a hedge of thick foliage with a natural height about the same as Ribes alpinum, fifteen to thirty inches. Like alpine currant, it requires little shearing to keep it in formal condition, and may be easily held to either a flat or a rounded-top hedging.

Among the many varieties of tamarix which have been introduced and planted in the northern states, Kashgar tamarix appears to be the best for the north. It is absolutely hardy and develops a full-branched shrub of five to eight feet in a short time. The blooms are deep pink and the foliage is silver green. This variety has acquired several botanic names, and, on account of this confusion, it is generally known among nurserymen by its common name, Kashgar tamarix.

Juniperus scopulorum, the mountain cedar, corresponds in general habit to the native red cedar of northern Minnesota and Wisconsin. It has all of the variations in type, as has J. virginiana. Among these types are slender pyramidal trees, tall broad trees and a number of distinct types in lower height. Silver cedar appears to be the common name now most generally used to identify this variety. The general color effect in

Field-Grown **ROSEBUSHES**

Popular varieties available in all 3 grades

American Beauty
Ami Quinard
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Killarney D. White
Lady Forteviot
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Margaret McGredy
Miss Rowena Thom
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Radiance Red
Red Hoover
Rose Marie
Roslyn
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Sunkist
Syracuse
Talisman
Vaterland
Willowmere
Cl. American Beauty
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VIGOROUS FIELD-GROWN ROSES.

Low budded on Multiflora understock. Handled and graded with utmost care. Popular varieties. Three grades. WRITE FOR LIST.

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New Rose
TEXAS CENTENNIAL
(Red Hoover)
Plant Patent No. 162

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Also for our general list of roses.

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ROSES

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Lang Rose Nurseries
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ROSES

Have 30,000 2-year Field-grown Texas Roses Budded on Multiflora. Will sell cheap.
Ask for list and prices.

W. C. ERWIN, Waco, Tex.

AMERICAN ELM

2000 from 1 to 2½-in.
Write for prices.
Must move them this fall.

WAYSIDE NURSERIES
Sta. F. R. 9 Milwaukee, Wis.

STOCK YOU WILL NEED

Cotoneaster Acutifolia, 18 to 24 ins.; 2 to 3 ft.
Cornus Paniculata, 18 to 24 ins.; 2 to 3 ft.
Cornus Sibirica, 2 to 3 ft.; 3 to 4 ft.
Rosa Setigera, 18 to 24 ins.; 3 to 4 ft.
Rosa Blanda, 18 to 24 ins.
Ribes Alpinum, 15 to 18 ins.; 18 to 24 ins.
Rhus Canadensis, 18 to 24 ins.; 2 to 3 ft.
Balleana Poplars, 5 to 6 ft.; 6 to 8 ft.
Ask for quotations

ESCHRICH'S NURSERY, Sta. F, Milwaukee, Wis.

Canterbury Boxwood

Buxus suffruticosa and B. sempervirens.
Selected uniform plants; bushy and foliaged to center; masses of fibrous roots. Finished specimens from 4 inches up, ready for quick shipment. Prices lower, plants larger. Ask for special list.
CANTERBURY, Box A, Easton, Md.

its native soil of the Rocky mountain slope is a gradation from a light but real green, up to a bright silvery blue. Some of the most outstanding types are now being propagated by grafting, and thereby fixing a uniformity in the variety so produced. These grafted types are offered under various trade names and with a description of their form and color. The fast increasing popularity of J. scopulorum and its varieties is due not only to its brilliance of color and pleasing form, but also to the fact that it is a true drought-resister and has well proved its immunity to the hot dry winds of the past several years.

GARNET RASPBERRY.

The variety of raspberry which has been on trial at the North Dakota experiment station under the number P117 has just been given the name Garnet. This is a purple variety of raspberry, a second-generation seedling from a cross between Plum Farmer and Latham. It apparently combines the hardiness of Latham with the heat and drought resistance of Plum Farmer. It has lived through and fruited under conditions where other varieties were practically destroyed by red spider. The fruit is purple, somewhat the color of garnet. It reproduces by means of suckers, but the suckers are not so abundant as in true red varieties, according to Dr. A. F. Yeager.

NORTHERN NUT GROWERS.

The Northern Nut Growers, which held its twenty-eighth annual meeting this autumn, elected as officers for the ensuing year the following: President, J. Ford Wilkinson, Rockport, Ind.; vice-president, Dr. A. S. Colby, Urbana, Ill.; treasurer, Carl F. Walker, Cleveland, O.; secretary, George L. Slate, New York experiment station, Geneva, N. Y.

The 1938 meeting of the association will be held at Boston, Mass., September 12 and 13.

The proceedings of the annual convention appear in a bound volume, which gives as much information on current problems of nut growers as is probably available between covers.

LILACS and mock oranges make excellent hedges for service yards.

SHADE TREES

	Per 10	Per 100
Ash, Am. White, 10 to 12 ft.	$7.50	$65.00
Ash, Am. White, 2 to 2½-in. cal.	15.00	125.00
Catalpa Bungei, 5 to 6 ft.	7.50	65.00
Elm, American, 10 to 12 ft.	7.50	65.00
Elm, American, 1½ to 2-in. cal.	9.00	80.00
Elm, American, 2 to 2½-in. cal.	12.50	115.00
Flowering Crab, 3 to 4 ft. (Eleyi, Floribunda, Hopa, Sargentii)	4.00	....
Japanese Cherry, 3 to 4 ft.	7.50	65.00
Japanese Cherry, 4 to 5 ft.	8.50	75.00
Jap. Weeping Cherry, 1-yr., 5 to 6 ft.	13.50	125.00
Maple, Norway, 8 to 10 ft.	9.50	85.00
Maple, Norway, 10 to 12 ft.	11.00	100.00
Maple, Norway, 2 to 2½-in. cal.	20.00	185.00
Oak Pin, 2 to 2½-in. cal.	25.00	....
Oak Pin, 2½ to 3-in. cal.	40.00	....
Plane, Oriental, 2½ to 3-in. cal.	20.00	....
Poplar, Lombardy, 6 to 8 ft.	2.50	20.00
Poplar, Lombardy, 8 to 10 ft.	3.00	25.00
Poplar, Lombardy, 10 to 12 ft.	4.00	35.00

Write for prices on other varieties and sizes.

WAYNESBORO NURSERIES, INC.
Waynesboro, Virginia

APPLE TREES

We offer to the trade an extra-fine lot of 1-year Apple Trees; all grown from Whole Root Grafts. A complete list to select from. This stock is unusually vigorous and strong. Your customers will like these trees.

Send us your list of requirements for special fall booking prices.

E. W. Townsend Sons Nurseries
Wholesale Dept.
Salisbury, Maryland

LINING-OUT STOCK

Complete list of deciduous lining-out stock this year.

Place your order now for either Fall or Spring shipment, and avoid disappointment when wanted.

THOMAS B. MEEHAN CO.
Dresher, Pa.

LINING-OUT STOCK

Our complete catalogue is in your hands. Better get that order in before shortages appear.

HILL TOP NURSERIES
Casstown, Ohio

HERBS

Pot-grown plants; over a hundred varieties. Dried Herbs for Flavoring and Fragrance. Other plants of unusual character and with the charm of old-time gardens.
Write for Catalogue

Weathered Oak Herb Farm, Inc.
BRADLEY HILLS, BETHESDA, MARYLAND

PEONIES

All types, including Tree Peonies

The Cottage Gardens
Lansing, Mich.

New Louisiana Law

Operation of State Horticultural Commission under Act Licensing Nurserymen and Others

Now functioning is the Louisiana state horticultural commission, charged, by an act passed last year by the Louisiana legislature, with licensing florists, nurserymen, landscape gardeners, tree surgeons and persons in the entomological and pathological professions. P. A. Chopin, florist of New Orleans, is a member of the commission; E. A. McIlhenny, nurseryman of Avery Island, is another. The chairman is Harry D. Wilson, state secretary of agriculture, and the remaining two of the 5-member board are W. E. Anderson, state entomologist, and J. W. Bateman, director of extension.

The act creating the commission was sponsored by the florists and horticulturists, in the belief that licensing will aid the legitimate operation of the horticultural trades, and approved by the state administration as the best way to protect the industry against unscrupulous dealers' impositions on the public.

Louisiana is the first state to pass such a law, which, with the regulations made to enforce it, provides for examination by the commission of every applicant for a license; the posting of a $1,000 bond by persons in all the trades affected but the growers of plants; reports to clients after some of the services, such as tree surgery, have been given; a check-up by the commission on work done under contracts of longer than a year's duration; prohibition to advertise or solicit services unless a license has been obtained, and fines or imprisonment for violation of any of the regulations.

To Whom Law Applies.

Precisely to whom the law applies is stated, for the enforcing regulations define a horticulturist as a "nurseryman or person skilled in growing and preparing for market of fruit trees, nursery stock, shrubs and all kinds of ornamental plants and flowers and the grades of same (and engaged in such at an established place of business).

"Floriculturist," the rules continue, "shall mean a person skilled in growing, grading and caring for flowers, arranging bouquets and/or designs (and engaged in such at an established place of business).

"Landscape gardener shall mean a horticulturist and floriculturist skilled in selecting, arranging and setting horticultural and floricultural plants to obtain the best results in promoting growth and obtaining the best effect in appearance by so doing.

"Dealer horticulturist and/or floriculturist shall mean a person skilled as a horticulturist and/or floriculturist and engaged in buying and selling horticultural and/or floricultural plants and plant products at an established place of business."

Owner Needs License.

Of course, it is the owner of a business who requires a license. But in the case of a firm for which all responsibility is assumed by one person, he is the one to whom a license is issued. Or an owner may delegate an employee actively in charge as the person to pass the test given before a license is issued, and it will be given to the owner, naming the employee supervisor and holding him responsible for the professional services of the owner's workers. A license is valid for an indefinite period, unless revoked for cause, and then may be renewed under conditions set by the commission.

Before a license is issued, the applicant must pass a test given by the commission covering his professional services and then submit for approval any typed or written forms of contract to be entered into for a period of more than one year in the practice of his profession. No bond is required of persons engaged in the propagation and production of plants, but an annual bond of $1,000 is posted by a person in any of the other trades covered by the law if no contracts are entered into for more than one year. But persons who enter into contracts for more than one year must supply not only the surety bond, but one of $1,000 each year of the contract as a guarantee that the services rendered the client will be satisfactory.

Once a month the licensee must provide the commission with a list of all jobs contracted for and completed during the preceding month, and the commission makes inspections to determine whether the contract has been worthily fulfilled, continuing such checks monthly until the work is satisfactory. Persons applying measures to control insect pests and plant diseases or doing landscaping or tree surgery must after a time reëxamine their work and give a report to the client. No one is allowed to advertise the professional services covered by the law unless he has a license.

Conviction of violation of any of the regulations promulgated to make the law operate will result in a fine of "not less than $10 nor more than $100 or imprisonment for not less than ten days nor more than thirty or both in the discretion of the court."

WASHINGTON MEETINGS.

The newly formed Washington State Nurserymen's Association has been seeing plenty of activity in view of attempts of union organizers to compel negotiations with them. Three meetings have been held within the past thirty days, and another will take place the last part of this month.

The nurserymen have maintained that because nursery labor has been defined as agricultural, both in the ruling of the internal revenue bureau in the application of the social security act and in the wages and hours law as passed by the House of Representatives at the last session of Congress, there is no compulsion for nursery firms to negotiate with the unions under the Wagner act, the short name for the national labor relations act. The Wagner act stated in its definition of "employee" that the term "shall not include any individual employed as an agricultural laborer."

Representatives of the local union addressed two of the Washington nurserymen's meetings, but their appeals failed of effect. A committee of three nurserymen was appointed in consequence of a motion prevailing at one meeting. The report the committee presented at a later meeting, involving a proposed union agreement, was rejected by vote at the meeting. The matter is at present in abeyance while federal authorities at Washington, D. C., are consulted, inasmuch as report is prevalent that the national labor relations board ruled recently that a nursery employer is not compelled to negotiate with a union attempting to organize field labor.

SPECIAL 30 DAY SALE
of Lining-out
and Specimen Stock
Hardy and Rare Trees, Shrubs, Ferns, Vines and Herbaceous Perennials of the Blue Ridge Mountains.
Write for price list.
GARDENS OF THE BLUE RIDGE
E. C. Robbins
Ashford, McDowell Co., N. Car.

Asparagus Roots
We offer to the trade one of the largest plantings of 1 and 2-year roots in the east. Write us for prices.
E. W. TOWNSEND SONS NURSERIES
Salisbury, Maryland

VASE ELM

			Per 100	Per 1000
500	1¾	to 2 -in. ...	$125.00	$1100.00
2000	2	to 2½-in. ...	175.00	1500.00
1200	2½	to 3 -in. ...	200.00	1750.00
500	3	to 3½-in. ...	275.00	.....

MOLINE ELM

200	1¾	to 2 -in. ...	125.00	.....
500	2	to 2½-in. ...	175.00	.....
500	2½	to 3 -in. ...	200.00	.....
500	3	to 3½-in. ...	275.00	.....

SCHWEDLER MAPLE

300	2½	to 2¾-in. ...	275.00	.....
250	3	to 3½-in. ...	350.00	.....

AMERICAN ELM
5 to 10-in. diameter. Prices on application.
GOLF NURSERY
Shermer Rd. Northbrook, Ill.

CLOSING-OUT SALE
On account of ill health, I am closing out my nursery.
Carolina and common Hemlock, all sizes up to 7 ft.
White Pines, 6 to 8 ft.
Blue Spruce, 2 to 3 ft.
Black Spruce and Norway Spruce, 2 to 4 ft.
Balsam, 4 to 6 ft.
Azaleas, several varieties and sizes; Rhododendrons, all sizes.
Have only about 100 to 300 of each of the above plants.
Mrs. J. H. Von Canon
Banners Elk, N. C.

1887 *1937*

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We offer for Fall 1937 and Spring 1938 our usual line of

SHRUBS EVERGREENS
FOREST AND SHADE TREES
VINES AND CREEPERS
NATIVE PLANTS

Write for Fall Trade List now ready

FOREST NURSERY CO., INC.
J. R. Boyd, Pres. McMinnville, Tenn.

BARBERRY THUNBERGII SEEDLINGS

1-year

6000, 3 to 6 ins. 8000, 6 to 9 ins.

25,000 **Ampelopsis Veitchii,** 1-year seedlings
2,000 **Ampelopsis Veitchii,** 2-year transplants
Asparagus, Pedigreed Washington, 2-year
Hydrangea Pee Gee, 3 to 4 ft. and 4 to 5 ft.

T. B. WEST & SON
Maple Bend Nurseries Perry, Ohio

HARDY AZALEAS

Kaempferi, Poukhanensis, Schlippenbachii, Mucronulata, Vaseyi, Calendulacea.

Enkianthus, Juniperus Rigida, Hick's Yew, Ilex Bullata, Photinia, Honey Locust, specimen Mughos, Austrian and Limber Pines.

Fine variety of high-grade Nursery Stock.

Large Yews, 12 to 15-ft. spread.

Write for prices.

BRIMFIELD GARDEN NURSERY
245 Brimfield St. Wethersfield, Conn.

PRIVET and BERBERIS
Splendid Stock
Write for Special Quotations
LESTER C. LOVETT
Milford Delaware

Ampelopsis Veitchii Forcing Roses
Barberry Thunbergii
And Complete Line of Nursery Stock
C. R. BURR & COMPANY, Inc.
Dept. A— Manchester, Conn.

Twenty Million Strawberry Plants
Complete list of all the new varieties.
We furnish packing out service for nurserymen and seedsmen. Write for wholesale price list.
E. W. TOWNSEND SONS NURSERIES
Salisbury, Maryland

TEXANS SEEK LOWER RATE.

During 1936 at the time specimen shade trees and shrubbery were being moved in large quantities for landscaping the grounds at the Texas centennial exposition, the nurserymen of Texas prevailed on the railroads to grant a special rate on balled and burlapped nursery stock. The specimens required extra-heavy balls of soil or special boxing and naturally the weight was greatly increased. The railroads made a special rate effective on centennial shipments whereby column 20 rates applied on 30,000 pounds minimum carload. It developed that quantities of large specimens were transplanted, a good proportion being moved from nurseries of the state to the centennial grounds by railroad, whereas theretofore quantities had been shipped by motor freight truck.

The rate was utilized quite extensively, and upon an application from the nursery interests of the state, the rate was extended to apply to all 30,000-pound carload shipments between points within Texas. Landscape contractors found this rate of important value in being able to ship large shade trees and large specimen evergreens on an economical basis, and during a few months many carloads were moved.

The tariff bureau docked a special hearing for November 2, for consideration of the establishment of this special rate as a permanent one for Texas. The hearing, however, has been postponed until December 7.

In the meantime the transportation committee of the Texas Association of Nurserymen, coöperating with tariff managers and nurserymen from various points in the state, is assembling data and information with the expectation of prevailing on the bureau to establish this classification as a permanent rate effective in the state.

EASTERN COUNCIL TO MEET.

The Council of Eastern Nurserymen will hold a meeting December 1 at the Hotel New Yorker, in New York city, for the purpose of setting up a more permanent organization, either under its present title or as an eastern chapter of the American Association of Nurserymen. Some weeks ago a plan was formulated for the inclusion of the eight associations affiliated in the council in a chapter of the national organization under the by-laws adopted at the 1937 convention. The response of the membership will be taken up at the coming meeting and decision made. All eastern nurserymen are welcome.

Election of officers will also be held. The present incumbents are: Chairman, John Jennings, Springfield, N. J.; vice-president, Joel Barnes, Yalesville, Conn.; secretary-treasurer, Fred D. Osman, New Brunswick, N. J.

OREGON ELECTION.

At the recent annual meeting of the Oregon Nurserymen's Association, the following officers were elected: President, J. Frank Schmidt; vice-president, E. M. Dering; secretary, J. E. French, and treasurer, Fred Barsch. As trustees were elected Earl Houseweart, B. A. Mitchell and C. B. Miller.

TEN additional acres of land have been leased by the Brooks Nursery, Lafayette, Ore., for growing peach trees.

TAXUS CUSPIDATA CAPITATA

(Upright Japanese Yew)

Our knowledge of the manifest qualities of this evergreen prompts us to transmit a share of the high regard we hold for it. Decidedly the best "all purpose" evergreen in our huge nursery, it ranks as "America's Public Evergreen No. 1."

An interesting deep green, holding good color throughout the entire year; contrasts beautifully in arrangement with other evergreens; dignified and lovely as a specimen; excellent in foundation planting; hardy; not particular as to location; dense, compact and practical as a hedge; adaptable to any desired shearing.

The fibrous roots of our Taxus are a result of frequent root pruning, insuring a hundred per cent earth ball, with almost perfect transplanting success. Sizes for all planting conditions. Quotations on request.

BOBBINK & ATKINS
Rutherford, New Jersey

20,000 **ELMS, American, Vase, Moline,** up to 4 inches, transplanted.

4,000 **MAPLE, Norway,** up to 2½ inches, transplanted.

2,000 **WILLOW, Thurlow,** 8 to 10 ft. and 10 to 12 ft.

10,000 **SPIRÆA, Vanhouttei,** 3 to 4 ft. and 4 to 5 ft.

Send for list on many other items.

C. M. HOBBS & SONS, Inc.
Bridgeport, Indiana

Largest Nursery in Indiana. Established 1875.

LINING-OUT STOCK
Connecticut Valley Grown
Seedlings - Rooted Cuttings
Evergreen and Deciduous
Write for list
C. E. WILSON & CO., INC.
Manchester, Connecticut

Princeton Nurseries
of PRINCETON, N. J.
SUPERIOR
Hardy Ornamentals

EVERGREENS
For Seventy years growers of Quality Evergreens
Lining-out Stock a Specialty
Write for Trade List
EVERGREEN NURSERY CO.
Established 1864 : STURGEON BAY, WIS.

MARYLAND OUTDOOR SHOW.

Classes Open to Nurserymen.

Among the exhibitors from all parts of North America who will portray every phase of outdoor life will be nurserymen of Maryland who will exhibit in competitive classes at the North American sports, garden and outdoor life show next February. The show, filling both floors of the huge Fifth Regiment Armory, where the national flower show in 1934 won nation-wide acclaim, will open February 11 and continue for nine days. It is sponsored by the Maryland Outdoor Life Federation.

The following competitive classes are open to nurserymen, landscape contractors, commercial gardeners and growers:

(9.) A woodland or mountain glen, featuring a waterfall, pool among boulders, or outcrop of rock. Containing hemlocks, blooming rhododendrons, laurel, native azaleas, wild flowers, such as trout lily, lady's-slipper, ferns and other appropriate material. Live trout or other native fish permitted. Area 515 square feet.

(10.) A wild garden, with native trees or shrubs as a background. Area 300 square feet.

(11.) A naturalistic rock garden, showing proper use of native trees, shrubs and alpine plants. Mounted birds permitted. Area 285 square feet.

(12.) A bog garden, a marshy spot, showing correct use of aquatic or semiaquatic plants, woody or herbaceous. Use of mounted birds, waterfowl or mammals permitted as accessories. Area 285 square feet.

(13.) Group of native flowering trees and shrubs, native only. Arranged for naturalistic effect. Area 350 square feet.

(14.) Garden of blooming azaleas. Arranged for naturalistic effect. Native or exotic kinds permitted. Appropriate companion plants permitted. Area 350 square feet.

(15.) A winter woodland scene, with appropriate native plants, featuring bright berried shrubs. Mounted birds, small animals and artificial snow permitted. Area 250 square feet.

Thousands of dollars in cash prizes and handsome trophies are offered in these classes.

William C. Price, president of Towson Nurseries, Inc., Towson, Md., is chairman of the nursery and landscape committee of the show. Other members are: J. J. Chisolm, secretary-treasurer of the Maryland Nurserymen's Association, Chevy Chase; Mr. Coplen, of the Rock Creek Nurseries, Rockville; Henry Hohman, of the Kingsville Nurseries, Kingsville; Frank Primrose, of the Loudon Nurseries; Howard I. Moss, of I. H. Moss, Inc.; Andrew Simon; William Bauer, of Fred Bauer's; William Keir, of the Keir Nurseries, and G. L. Warner, of Warner's Landscape Service, Baltimore; J. E. Stoner, of the Westminster Nurseries, Westminster; D. F. Shipley, Jr., of Shipley's Nursery, Towson, and Jesse P. King, of the Ridgeville Nurseries, Mount Airy. R. Brooke Maxwell, who directed installation of the 1936 national flower show, heads the installation committee.

Commenting on the nurseries' participation in the show, Mr. Price said, "Having examined plans for the show, I believe it will exceed in attendance any other show in which nurserymen have been invited to participate. It represents not only garden clubs, but all conservation interests in Maryland and neighboring states. The work of the nursery is an essential part of conservation. Even the smallest rock garden or pool or the planting of trees and shrubs teaches practical conservation lessons. The relation between the beauty of growing things, their natural and harmonious arrangement and the vital problems of conservation is so close that I believe this show will be of benefit to the entire nation." The show will present in colorful, dramatic pictures the wild life of the entire continent. Exhibits will be brought from Mexico, Canada and various states in this country.

A woodland trail, approximately a city block long, will be presented by the Federated Garden Clubs of Maryland. In this trail the variations in vegetation and topography from the ocean sands of the eastern shore to the mountains of western Maryland will be shown. According to officials of the show, it will be the first time an exposition of this nature has offered an opportunity for nurserymen and gardening enthusiasts to participate.

The following nurserymen in Maryland are now planning displays at the show: Towson Nurseries, Inc.; Westminster Nurseries, Ridgeville Nurseries, Shipley's Nursery, Warner's Landscape Service, Loudon Nurseries and Fred C. Bauer.

Rules governing the show and schedule of competitive classes open to nurserymen may be secured by writing to the Maryland Outdoor Life Federation, 811 North Charles street, Baltimore, Md.

NEW GRIFFING BRANCH.

Extending their retail landscape service, the Griffing Nurseries, Beaumont, Tex., recently completed arrangements for the opening of a branch office in Corpus Christi, where a branch division was maintained for many years when the Rio Grande valley was being first developed.

The main service now is in the landscape field, whereas several years ago the efforts were principally devoted to orcharding.

Much in keeping with the branch department which the Griffing Nurseries have in Houston, an arboretum is being established, where the display grounds are being planned and developed as one big garden area, the plant material properly labeled for the general public's inspection. The office, a building of modernistic design, is framed in the center of the garden with the well designed display of shrubbery. The arboretum is located in the principal residential section of Corpus Christi, at a corner of Third and Craig streets.

In charge is Torben Rasmussen, who has had years of experience in this field, his work being principally carried on in coastal cities. Mr. Rasmussen went to Corpus Christi from Virginia.

MUNSON NURSERIES SOLD.

Munson Nurseries, Denison, Tex., sold their interests in the vineyard and nursery south of the city to J. V. Smith, nurseryman of Sherman, Tex. Mr. Smith was formerly manager and coowner of the Kerr Nursery Co., Sherman.

Fame of the Munson firm rests largely on the epoch-making work of its founder, the late T. V. Munson, in the development of superior grape varieties. He was rated as one of the foremost men in this field and was the recipient of a decoration from the French government for his labors, which resulted in saving that country's vineyards and hence its wine industry. He introduced a number of grape varieties that are still outstanding and was the author of books on botany, breeding and culture of grapes. The Standard Cyclopedia of Horticulture carries an article by him.

A graduate of the University of Kentucky, Mr. Munson established the nursery at Denison in 1876. After his death, Mr. Munson was succeeded by his son, Will B. Munson, who carried on the business with success until his death a few years ago. Mrs. Minnie Munson then continued the business until the recent sale. She left immediately for Ingleside, Tex., on the gulf coast. This place is well known as a grape-growing center, using Carman and other Munson varieties exclusively, and it is assumed she will engage in similar business there. The new name of this old establishment will be the Denison Nurseries.

TEXAS NOTES.

In a recent article, it was reported that Arthur F. Truex stated there are nine municipal rose gardens in Texas,

DANADA NURSERY

Complete assortment of hardy
EVERGREENS and SHADE TREES
SURPLUS
5000 American Elms, 1 to 4-inch
5000 Moline Elms, 2 to 4-inch
3000 Chinese Elms, 2 to 5-inch
Specimens three times transplanted — excellent condition

Location— Wheaton - Naperville Road
Address— Box 527, Wheaton, Ill.

JACKSON & PERKINS COMPANY
Wholesale Nurseries
NEWARK, NEW YORK STATE

PEACH TREES

Thrifty June-budded Stock

We offer to the trade an up-to-date list of the leading varieties to select from. All of these trees are grown on our farms in Maryland. They have shaped up nicely and have a well balanced fibrous root system—the kind of stock that will please you and your customers.

We invite your inquiry and offer special prices on early fall bookings.

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Wholesale Dept.
Salisbury, Maryland

CHERRY TREES, 1-year
Early Richmond and Montmorency

PLUM TREES
Compass, Opata and Waneta

MAHALEB CHERRY SEEDLINGS
and also Myrobalan and Native Plum seedlings, in all sizes

FOREST TREE SEEDLINGS
in Green Ash, Catalpa, American Elm, Black Locust, Honey Locust, Thornless Honey Locust, Soft Maple, Russian Mulberry and Osage Orange. Prices reasonable.

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100,000 Apple and Pear scions in leading varieties. Also Apple and Pear grafts. 100 bus. large Peach Pits, $2.00 per bu. Seeds: Sumac, Red Snowberry, Walnut, Hickory and Chestnuts.
WANTED: Lining-out evergreens and shrubs.

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for sale
in wide assortment
at bargain prices

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Peach Seed
Pin Oak Ilex Crenata
General Line Quality Ornamentals
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Peach Seed and Peach Trees
Write for prices. Large acreage of nursery stock. Will appreciate your want list.
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PEACH PITS
Our Pits Compare Favorably
With the Best
HOGANSVILLE NURSERIES
HOGANSVILLE, GEORGIA

four of which he stressed—Fort Worth, Port Arthur, Houston and Arlington. Frank L. Bertschler, park superintendent at Beaumont, calls attention to Beaumont's municipal rose garden, with 2,500 bushes, planted in 1932. In this garden, only five outstanding varieties are used, the attention being to give the most constant effect rather than display varieties. Red Radiance, Radiance, Talisman, Kaiserin Auguste Viktoria and Columbia are planted. In addition, there are a number of smaller gardens over the city. Several other gardens are planned, including one at the Municipal Golf Club.

In a small town in northwestern Texas, Stephenville, Ross R. Wolfe, of Wolfe's Nursery, has arranged in the front window of the Philip-System ice cream parlor on the north side of the square a display of products grown on his land. Included in the show window are several varieties of pecans, some English walnuts, Brazil nuts and many other products grown at the nursery, located a short distance west of the city limits.

DISCUSS QUARANTINE 37.

(Continued from page 4.)

and Frank McKennon, Salem, Ore., both urged stricter enforcement of present regulations and better inspection of imported materials growing in this country. It was stated that inspections called for under quarantine 37 have not been made during the last several years. The Oregon men suggested that an attempt be made to secure a larger appropriation for the bureau so that more adequate inspection may be possible.

Strong Gives Stand.

Dr. Lee A. Strong responded to questions on what might be expected in the matter of quarantine revision by stating that quarantine 37 is illogical and that it should be changed. He referred to his address at the convention of the American Association of Nurserymen last July and explained that his stand was clearly given at that time. He called particular attention to troubles with the special-permit situation, which he declared is entirely unfair. His contention is that if any plants or plant materials are dangerous because of pests or diseases they should be kept out entirely; if plant materials are not affected, they should be admitted freely without restriction other than inspection at the port of entry. Plants with soil, of course, should not be admitted at all, he said.

Dr. Strong stated that he realized that the Department of Agriculture was instrumental in the beginning in encouraging nurserymen and others to go into the business of producing plants which had previously been imported, but it is time now that the whole quarantine matter be straightened out. There is no good reason, he said, to perpetuate a mistake.

Hearings.

Asked if he would hold a public hearing on the subject, Dr. Strong replied that he would like to have an open hearing that would clear up the whole quarantine situation, but that the usual hearings at Washington were of little value. He would like to have a hearing, he said, at which it could be determined definitely what pests and diseases are dangerous, which plants are

STRAWBERRIES

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From our large plantings, we are in position to fill your orders direct. Let us quote you.

We offer 50,000 Latham and 25,000 St. Regis Raspberries at a low price for immediate sale.

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Evergreens — Shrubs
Lining-out Stock
Send for Complete Trade List
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LATHAM RASPBERRIES
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ANDREWS NURSERY
FARIBAULT, MINN.

Wholesale Growers of
Grapevines, Currants, Gooseberries, Blackberries and Raspberries
Let us quote on your requirements
FOSTER NURSERY COMPANY, INC.
69 Orchard St. Fredonia, N. Y.

Wholesale Growers of
SMALL FRUIT PLANTS
Leading varieties of Grapes, Asparagus, Rhubarb, Currants, Berry Plants.
Fall price list now ready.
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BLUEBERRIES
Six Varieties
2-year-old plants. 1 year-old rooted cuttings. Also cutting wood.
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Evergreen Seedlings, Transplants, Maples, Nut and Apple Trees.
Write for fall price list.
Special reduced prices.
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WANTED TO BUY
Quantity of large fruit trees
2 to 3 inches in diameter
Prefer Apples, a few Pears, Prunes, Plums and Sour Cherries.
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Leaves, large dark green. Growth, vase shape, rapid. Seeds are collected from a single specimen tree. Leaves on the parent tree remain rich green through the summer. Limited supply for immediate delivery. 18 to 24 ins., $15.00. 2 to 3 ft., $17.50. 3 to 4 ft., $35.00 per 100.

Chinese Elm, Ulmus Pumila

2-year transplants

4 to 5 ft.....$25.00 per 100
5 to 6 ft..... 40.00 per 100

WOODS NURSERY CO.
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APPLE SEED

As a boy have you ever broken your knife trying to cut a stick from a Wood Apple tree (Malus sylvestris)? If you had you would know why you would not want to plant this apple for stock. Its wood is harder than iron.

Have you ever been fooled biting into a delicious-looking Cider Apple when you were over with the boys in France? If you had you would have had an unpleasant surprise and learned that these Apples are a strain different from our table varieties, and so they are, closely related to the Wood Apple, but with the softer wood of the Common Apple, a hybrid race between the two and as such apparently the most suitable strain for stock.

French Cider Apple seed, for fall delivery, 85c per lb.

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Seeds for Nurserymen and Foresters
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Write for prices

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Peonies: Tree and Herbaceous, best varieties. **Oberlin Peony Gardens, Sinking Springs, Pa.**

Peonies, Irises, Poppies, Hemerocallis, you save at least 20 per cent, as I must move from leased ground. Send me your want list. **Thimlar Nurseries, Fort Wayne, Ind.**

Azalea Liners.
We will have approximately fifty thousand Azalea liners for February-March delivery. Place your order now.
Florida Nursery & Landscape Co., Leesburg, Fla.

Peach Seed, 200 bus. screened, natural; average 7200 to the bu. 150 bus. country run, average 6200. 100 bus. large seeds, average 4500 to bu. Immediate shipment.
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Hardy Privet Amoor North, 1-year, 6 to 9 ins., $1.50 per 100, $12.50 per 1000; 9 to 12 ins., $2.00 per 100, $15.00 per 1000; 12 to 18 ins., $2.50 per 100, $20.00 per 1000; rooted cuttings, $6.00 per 1000. Packed free.
Wm. Mandel, Nurseryman, Bloomington, Ill.

affected and from what countries they come so that the quarantine could be rewritten. He is willing, he said, to meet with groups of interested persons in the various sections of the country and thrash out the problems. He reiterated that the purpose of the quarantine act is to keep out pests, not plants.

It was announced that the subject would be discussed at the meeting of the quarantine committee of the National Association of Commissioners and Directors of Agriculture of the United States, which was scheduled to be held at Washington, D. C., November 15.

The National Plant Board took no definite action as a result of the discussion except that among the resolutions passed was one requesting more adequate funds for enforcement of foreign plant quarantines. Other resolutions passed at the board meeting recognized the accomplishments of and urged continuation of the $2,000,000 emergency insect control appropriation; urged the continuation of adequate appropriation for enforcement of the Mexican fruit fly work; asked for landing places for foreign airplanes where adequate inspection can be provided by the bureau of entomology. The board reversed its action taken at the last meeting in connection with noxious weed control and declared this subject not a function of the National Plant Board.

Officers elected were as follows: Chairman, M. S. Yeomans, Atlanta, Ga.; vice-chairman, Thomas J. Headlee, New Brunswick, N. J., and secretary-treasurer, E. L. Chambers, Madison, Wis.

Those Present.

Among those present, in addition to the officers named above, were the following members of the board: R. H. Bell, Harrisburg, Pa.; J. I. Griner, Olympia, Wash.; J. H. Montgomery, Gainesville, Fla., and Carl J. Drake, Ames, Ia.

Others present were Walter J. Robinson, Olympia, Wash., director of agriculture for the state of Washington; Leeman Anderson, Atlanta, Ga.; B. P. Livingston, Atlanta, Ga.; H. F. Seifert, Glen Ellyn, Ill.; J. Carl Dawson, Jefferson City, Mo.; Frank McKennon, Salem, Ore.; G. R. Hyslop, Corvallis, Ore.; Paul Stark, Louisiana, Mo., and Harold Welch, Shenandoah, Ia.

BOERNER HAS NICOLAS' PLACE.

Eugene S. Boerner, of the Jackson & Perkins Co., Newark, N. Y., has been appointed to head the company's plant research department, the position long held by Dr. J. H. Nicolas who died recently. The appointment took effect November 1. Mr. Boerner is well known to nurserymen and florists throughout the country, having traveled extensively in the interest of the firm.

HAROLD T. HOPKINS reports a busy season for T. R. Hopkins & Sons, Bothell, Wash., while he has been occupied in addition as secretary of the newly organized Washington State Nurserymen's Association, which has had several meetings at Seattle lately. Generous rains have helped the firm move a considerable number of evergreens, he states, but there has been no frost as yet, which is quite exceptional.

HEALTHY ROOT DEVELOPMENT

YOU can get better results with Evergreens, Shrubs, and Perennials of all sorts, if they are planted in a properly conditioned soil.

Dig in G.P.M. Peat Moss before you do any planting. It readily makes humus, keeps the soil well aerated at all times, and stores up moisture and plant food. It promotes vigorous root growth and luxuriant top growth.

G.P.M. Peat Moss comes in pressure packed bales to assure you more peat substance for your money. The "green" bale head distinguishes it from inferior grades. Write today for quantity prices and free literature. Address Dept. AM-21.

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HELP WANTED

Experienced greenhouse and nursery man. Am planning to build commercial type greenhouse for propagating wild azaleas, blueberries, wild flowers and small fruits, largely for stocking own place. Location four miles from small town in south. Applicant would also be required to be in charge of planting around home and artificial lake. Suitable small house will be built with lights, water and sewerage. Preferable, but not necessary, applicant also be in charge of care of four saddle horses.

Address No. 74, c/o American Nurseryman, 508 S. Dearborn St., Chicago, Ill.

HELP WANTED

Reliable single man, experienced in nursery, greenhouse, propagating and landscaping. Must be able to handle men, meet public and be American citizen.

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Nurseryman open for engagement, 28 years' experience in growing and propagating, nursery management, wholesale and retail selling. Well acquainted in middle west. For interview address No. 75, c/o American Nurseryman, 508 S. Dearborn St., Chicago, Ill.

FOR SALE

Two acres river bottom soil planted to diversified nursery stock. Greenhouse 20x60 ft., also work and fuel houses, 6-room modern house and other buildings. Stream runs year around through nursery, feeding large lily pool. Good business with fine possibilities; in Bothell, a town of about 1,000, nine miles from Seattle on main highway.

Darlington's Sunset Gardens, Box 124, Bothell, Wash.

WANTED

To buy tree digger, new or used. Please send full description and price. Address No. 76, c/o American Nurseryman, 508 S. Dearborn St., Chicago, Ill.

OBITUARY.

Charles O. Warner.

Charles O. Warner, of the Central New York Nurseries, Geneva, N. Y., a civic leader, churchman and member of the Geneva park board, died November 7 following an attack of acute appendicitis November 2. He was 53 years of age.

Mr. Warner was born in Palmyra, N. Y., May 6, 1884. He was at Newark, N. Y., for some time, being engaged in the nursery business, and he went to Geneva in 1915 and established a nursery business of his own under the name of the Central New York Nurseries.

He had a large interest in community affairs. He was an active member of the First Presbyterian church and was interested in everything that served to promote the welfare of the organization. He was particularly interested in the Boy Scout organization and helped to organize the Finger Lakes Council in 1924, of which he was president from 1929 to 1931. He was awarded the Beaver badge, given in recognition of outstanding service to boyhood—the highest award that the Boy Scouts of America can give to a layman. He was interested also in the affairs of the Geneva Automobile Club and the chamber of commerce. An active member of the Geneva park board, he gave freely of his knowledge of trees and shrubs in the development of the Geneva park system.

Surviving are his widow, two daughters, his mother, two brothers and two sisters.

Few but his closest friends knew that he was physically handicapped by the loss of both legs, suffered in a train accident when a young man. At the time of the accident he determined to surmount his infirmities and not to trouble others with them. This he so successfully did that few knew of his affliction.

All this is written about a nurseryman for a nurserymen's magazine, yet the fact stands out that his accomplishments in the nursery business are overwhelmingly shadowed by his accomplishments as a helpful member of society at large. Eulogies have been written about great leaders in high office to the neglect of some of those in more ordinary walks of life whose influence is far-reaching and whose examples of helpfulness radiate in every direction. It is well to pause in the press of active business life and personal ambition to reflect on the sterling characters that place a man like Charles O. Warner in the forefront of those who have held human values high and who by their example have left an imprint upon those who remain and who will come after. H. B. Tukey.

Jacob Edward Bergtholdt.

At his home at Auburn, Cal., Jacob Bergtholdt, 66, one of the owners of the Silva-Bergtholdt Co., Newcastle, died October 27. He had been ill for more than a year and had been a patient at a Sacramento hospital recently.

Mr. Bergtholdt was one of the pioneers in the nursery and orchard business in California. The Silva-Bergtholdt Co., which he founded with the late James Dudley, planted nearly 4,000 acres of orchard land in near-by counties and was once worth $1,000,000.

Mr. Bergtholdt was born at Nokomis, Ill., going to Newcastle in the 1890's. The business was started in 1898. Mr. Bergtholdt personally maintained large ranch holdings in the Newcastle and Gold Hill districts and he owned a hardware store at Auburn until it was destroyed by fire a few months ago.

Mr. Bergtholdt was mayor of Auburn in 1924 and was for years chairman of a taxpayers' association. At his death he was chairman of the board of trustees of the Methodist Episcopal church, Auburn, and a member of the Elks and Knights of Pythias.

Mrs. Nettie Bergtholdt, his widow; three sons, and three daughters survive him. Funeral services were held October 29, and interment was at the family plot at Newcastle.

James Brodie.

James Brodie, proprietor of the Biloxi Nursery, Biloxi, Miss., died October 26. He was 82 years of age. Mr. Brodie had lived in many parts of the world before going to Biloxi and establishing his nursery business forty years ago. He is survived by his widow; two sons, Robert and James, and a daughter, Dorothy.

Jesse E. Brannen.

Jesse E. Brannen, owner of the Boulder Crest Nurseries, Atlanta, Ga., died October 26 after a short illness. He was 53 years of age. Mr. Brannen was well known in the banking business and was cashier of a bank at Westwood, N. J., until he retired because of failing health in 1926 and went to Atlanta. Funeral services were held October 28 preceding burial at West View cemetery. Besides his widow, Mrs. Cecilia Voorhis Brannen, two daughters and three sons survive him.

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THE MIRACLE ROOT GROWER NOW AVAILABLE!

WHAT IS AUXILIN?

HOW is Auxilin used?

Auxilin—the miracle root grower—is a hetero-auxin, with its active ingredient—*Indolebutyric acid*—that actually induces strong, healthy roots to grow on cuttings from plants, shrubs and trees.

Auxilin comes packaged in liquid form for water dilution. No special equipment or experience needed. Simply follow directions using graduated phial furnished. Get results (as shown above in actual photograph of Camellia—rooted in 6 weeks when Auxilin treated) with hard-to-root and heretofore impossible-to-root cuttings.

PROFESSIONAL GROWERS: Special trade discounts on quantities of 3½ oz. or more. Auxilin is also available as Indolebutyric acid in crystalline form.

NOTE

⅛ oz. . 50c	½ oz. $1.00	3½ oz. $6.00	8 oz. $12.00
will treat up to 600 cuttings.	will treat up to 1,800 cuttings.	will treat up to 12,000 cuttings.	will treat up to 30,000 cuttings.

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Orange, New Jersey

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SEND FOR TRIAL SIZE **USE COUPON**

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Enclosed is $1. Send *postpaid* ½ oz. of Auxilin.
☐ Send literature and growers' discounts.
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Made of heavy asphalted stock. Non-porous, light, require little water, large soil capacity.

By growing roses, shrubs, vines and perennials in these pots and selling your plants while in full foliage and in bloom, you can extend your selling and planting season.

Send for free descriptive circulars and prices.

Cloverset Flower Farm
Ernest Haysler & Son
105th St. & Broadway **Kansas City, Mo.**

CATALOGUES RECEIVED.

[In writing for a copy of any of the catalogues reviewed below, please mention that you saw it described in The American Nurseryman.]

Hill Top Nurseries, Casstown, O.—With an index, a booklet giving wholesale prices for fall 1937 contains twenty-four pages. Listed are lining-out shrubs, vines, evergreens and trees; deciduous and evergreen grafts, flowering shrubs, hedge plants, vines, trees, field-grown evergreens, fruit trees, raspberries and transplanted perennials.

Leach's Nurseries, Riverton, N. J.—Wholesale catalogue for fall and next spring of pot-grown azaleas for forcing. The varieties are named, and there is a chart of forcing dates for the different varieties. An illustration shows 60,000 plants in a screen shed during summer.

Gardex, Inc., Michigan City, Ind.—Liberally illustrated comes the catalogue of the Gardex "Soil-Flow" garden tools, offered with handles of various lengths to suit the height of the user. New this season are the patented diamond point shares on several cultivators, and a dandelion puller. The catalogue, with cover in colors, quotes retail prices and contains an index.

WIN YOUR CUSTOMERS GOOD WILL . .
"BLACK LEAF 40" SURE KEEPS DOGS AWAY!
TELL THEM HOW TO DETOUR DOGS AROUND EVERGREENS & SHRUBBERY

● You can do your customers a real service by recommending "Black Leaf 40". A little "Black Leaf 40" sprayed on the lower branches of shrubbery and evergreens will keep dogs away, preventing stains and discoloration.

"Black Leaf 40" on bushes or evergreens is harmless to dogs—they just don't like the odor and go elsewhere. It is both an easy and an economical way of protecting shrubbery from the "dog menace". Your customers will also find many other uses for "Black Leaf 40"—the "versatile" insecticide.

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"Black Leaf 40" DETOURS DOGS AWAY FROM SHRUBBERY

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See this beautifully-illustrated new book, answering every question about Evergreens. Produced by America's leading Evergreen Nursery with a background of 80 years' experience with Evergreens. A cloth bound book, 7x9½", containing 320 pages. There are 50 chapters, including complete information on uses, descriptions, propagation, historical and cultural information pertaining to Evergreens. 360 illustrations, 45 in full color. Price $3.50, postpaid, anywhere in the United States. Sent with full privilege of approval.

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Box 305 DUNDEE, ILLINOIS
Evergreen Specialists America's Largest Growers

WHICH TWINE?

Jute is good, Sisal is good, Java is good, Cotton is good—but WHEN is any one of these the BEST for your purpose?

Send us a sample of what you are using, and we will recommend THE twine most suitable for YOUR purpose.

FREE "Knots the Sailors Use," 8-page booklet with 79 pictures shows how to tie almost any useful knot. Worth having—write today.

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Sept. 24, 1937

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and grow vigorous plants in much less than normal time

The time is past when propagating by cuttings means uncertain results. With the aid of Hormodin—the root-forming chemical developed by the Boyce Thompson Institute for Plant Research, Inc.—you can now obtain quicker and better rooting in higher percentages than ever before possible.

Consider the dollars and cents value of these Hormodin advantages. You can hasten the development of slower rooting species—transplant some varieties directly from the bench to field conditions—propagate from cuttings many species that ordinarily do not root successfully.

Hormodin comes in liquid form and is applied as a dilute water solution. The cost is only a fraction of a cent per cutting. To assure uniform root-forming potency, every batch of Hormodin is standardized both chemically and physiologically.

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This photograph shows the amazing root-growing power of Hormodin. Both the treated and untreated cuttings were in the same propagating bench under the same conditions the same length of time. Hormodin alone is responsible for the more profuse root growth.

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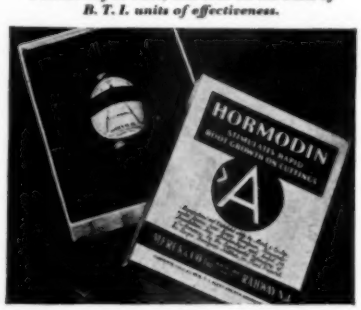

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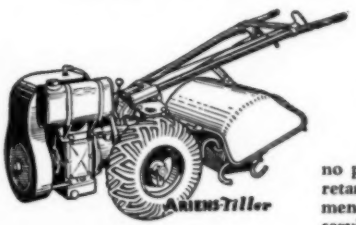

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THE AMERICAN TILLAGE COMBINE

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Nursery and Florist

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